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COMPUTERWORLD

INSIDE

IBM seeks new mainframe slot

BY ROSEMARY HAMILTON
CW STAFF

IBM sketched out its long-term plans last week to deliver a new kind of mainframe that will function as a corporate nerve center made up of tightly connected CPUs and processors dedicated to specific operations.

In other words, IBM said that more and more processing is being offloaded to smaller, cheaper systems, and the general-purpose mainframe — its cash cow — needs a new act.

While most users and analysts applauded this strategy, some suggested that it did not address one of the biggest problems with mainframes — cost.

"I'm not sure IBM has a good feel for where mainframes are going," said James Matsey, corporate information systems director at Reynolds Metals Co. "I know where they want to take them — they want to protect them. As long as they protect them and keep the cost so high, the economics will start forcing people off them."

IBM did not address pricing issues last week because the purpose of its strategy overview was merely to outline the new role of the mainframe. According to IBM executives, the goal is to capitalize on the mainframe's traditional strengths — including transaction processing, data management, security, large memory capacity and huge amounts of storage — for a corporatewide networked environment. Meanwhile, applications and interactive jobs can be moved to smaller platforms such as intelligent workstations.

"If they could just keep everyone buying mainframes, they would do that," said William Bluestein, an analyst at

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Downsizing dilemma

BY JEAN S. BOZMAN
CW STAFF

The rush to downsize mainframe applications has led to a flood of confusing product claims by vendors and overblown expectations by end users, according to analysts and information systems professionals. Many users, in their haste to move host applications to personal computers, risk making fundamental mistakes that could be prevented with greater IS involvement.

"The technology has outstripped many people's ability to deal with it," said Paul Winsberg, a principal at Database Associates in Berkeley, Calif., during last week's Database World conference in Santa Clara, Calif.

Transferring IS skills to dispersed business units will be a growing issue in the 1990s as distributed database applications begin to be installed, analysts said.

Nevertheless, "very few organizations can carry out a high-level implementation of client/server architecture across a division, a

Continued on page 117

Inside

Big Blue to users: You win

Installed base of VSE users

	1990*	1991*
U.S.	12,700	12,800
International	11,200	11,400

Source: International Data Corp. *Projected

Persistent loyalists, *users of IBM's VSE operating system will soon be rewarded with a major upgrade that has closer ties to MVS, according to IBM executives. Story, page 6.*

Few unions cutting bargain with high-technology 'devil'

BY J. A. SAVAGE
CW STAFF

Like John Henry, the burly character of legend who wields a hammer in a futile race against railroad machinery, labor unions that were faced with worker-displacing computer technology saw the end of the line as early as the 1950s. Yet only recently have most unions begun to use technology for their members' advantage.

With the notable exceptions of groups such as the Air Line Pilots Association and the International Association of Machinists and Aerospace Workers, most unions that offer technology training run it jointly with employers. At least one union has been so decimated by computer technology that it cannot afford to buy computers for training.

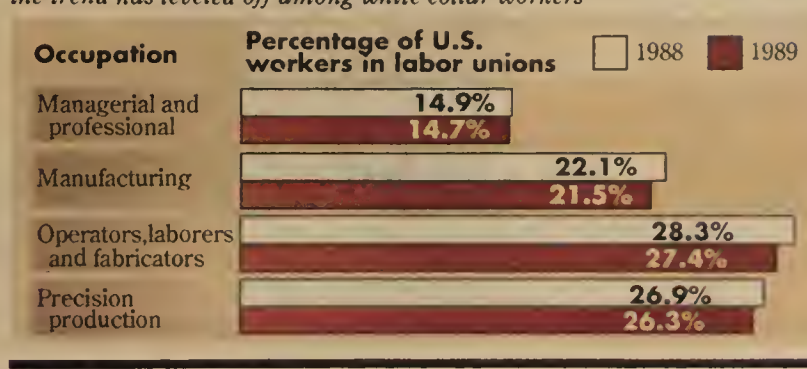
Calling for unions to negotiate "reasonable and human protections for workers against potentially adverse effects of job-destroying technological innovation," the AFL-CIO made its only policy statement on technology in 1979, with the position that mitigation could be found as long as technology prompted growth, said Markley Roberts, an economist at the AFL-CIO's research department. It was not until 1982, in the midst of the U.S. automobile industry recession, that a union first took steps to train members in computers and other basic skills.

"In the 1982 negotiations, when the union was making concessions, one of the tradeoffs was training," said Doug Fraser, former president of the United Auto Workers. The union launched some training efforts in 1983 and now has three

Continued on page 115

Blue-collar woes

Labor union membership continues to decline, although the trend has leveled off among white-collar workers



Source: Bureau of Labor Statistics CW Chart: Paul Mock

Unisys bets on chip implant

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — Unisys Corp. will unveil its latest computer today, a mainframe featuring a new architecture and components that analysts said is a clear precursor to Unisys' next-generation systems.

Dubbed the A16, the five machines in the new line span the upper half of Unisys' existing A series mainframes, now made up of the A12 and A17, which were introduced in 1985 and 1987, respectively. Not unexpectedly, Unisys continued a long tradition, announcing that the A16 will be object-code-compatible with the rest of the A family.

Without a doubt, though, the A16, which will range in price from $1.75 million to $5.9 million, is a step apart from the other members of its family. To start with, it uses Motorola, Inc.'s state-of-the-art bipolar logic chip, the MCA-III. Unisys

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IN THIS ISSUE

Quotable

"You don't just go to the store and buy parts when they break. You call around and ask friends who might owe you a favor."

ANATOLY VOLKAN

Systems director at a Leningrad-based turbine factory, on the state of computing in the USSR. See story page 117.

From *Spectacular Computer Crimes,* by Buck Bloom-Becker: "I've never put much stock in these so-called [software] licenses. The terms of these 'licenses' are almost invariably one-sided, taking as much as possible for the manufacturer and giving as little as possible to the buyer. Most significantly, many of the contracts also limit the warranty that comes with the software . . . A limited warranty, however, is a way for the manufacturer to avoid responsibility. It may say that if the software doesn't do what you reasonably expected it to do, that's too bad. Buy another product, but leave the manufacturer alone."

Cobol: Modernizing a trusty craft for the next decade. Page 87.

Britain Hill

Joseph Brophy laid his bagpipes aside while adjusting to a new role. Page 81.

EXECUTIVE BRIEFING

■ **One by one, the clues are coming together** as people try to figure out what the mainframe of the future will look like. IBM offered a peek at its view of Tomorrowland last week when it said the mainframe will remain the corporate nerve center, but it also will be a collection of smaller special-purpose computers rather than the monolith of the past. Unisys will take its own step into the future today when it introduces its next-generation mainframe. Meanwhile, a snag could be lying in wait for the downsizing that most observers expect to happen as corporations move applications and processing power away from the mainframe and into the department. Experts say that downsizing depends on greater user understanding of IS issues and complexities of networks and security systems. **Page 1.**

■ **You've got to adjust to seeing the big picture** when you take on strategic planning duties in the top IS spot. Execs who have made the switch advise acclimating yourself to business operations and the business environment before trying to draw up any plans. When you do have things under control, they say, be prepared for a very different view. Even IS issues have a different slant from this angle, requiring more reliance on intuition, developing good communications skills with top managers and keeping an eye toward the future. **Page 81.**

■ **The search for a competitive edge** through network technology is raising the telecommunications manager — once thought of as a reactive administrator — to a level within the corporate structure comparable with that of the IS manager. **Page 73.**

■ **With compensation a major motive,** it's not unusual for IS people to jump into the business of recruiting their fellow technical professionals. Some never look back, but others find that the salesmanship required is not for them. Still others fear they could not return to IS because they have become technically obsolete. **Page 98.**

■ **The persistence of users may be paying off** in the form of a promised new version of IBM's VSE and IBM's assurances that the second-tier mainframe operating system it has often seemed to ignore is now considered a strategic product. **Page 6.**

■ **It can be a waste of time** to try to justify training with outrageous measures based on the notion of return on investment, at least until it becomes practical to use some form of testing to gauge an IS professional's performance. A better approach is to analyze the IS training organization as a business in itself. **Page 111.**

■ **Out of the laboratory,** down from Olympus and into the field, MIT's Project Athena — and the parts of it named for characters in Greek mythology — is a distributed network management system looking for a new home in other universities and the business field. **Page 68.**

■ **On-site this week:** Computers have found a home in the crime and grime of New York's transit system, taking control of functions ranging from fare collection to rail maintenance. **Page 59.** Platform independence is the operative phrase in the North Carolina Department of Crime Control and Public Safety's five-year plan for application development. **Page 25.** A distributed database is doing its part to save the Earth — or at least the tiny parts of the planet containing the endangered species of plants and animals that The Nature Conservancy is working to protect. **Page 28.**

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Casualties of Stardent Wars

BY NELL MARGOLIS
and JAMES DALY
CW STAFF

The $25 million lawsuit filed earlier this month by Stardent Computer, Inc.'s co-chairmen against the company's chief financier, Kubota Ltd., could blast the fledgling firm out of the sky just as its business is beginning to get off the ground, company insiders and analysts said.

For starters, it has blasted the plaintiffs out of Stardent in the wake of their allegations that Japan-based Kubota attempted to steal Stardent's technology.

The firm's board of directors voted last week to fire co-Chairmen Allen Michels and Matthew Sanders, citing "conflicting management styles." Leaving no ambiguity as to which side it was on, the board also voted to extend its partnership with Kubota strategically and financially.

Stardent *ex-Chairman Michels*

The lawsuit may become a public relations nightmare for Stardent, as it is poised to breathe new life into the graphics supercomputer market within the next 10 weeks by unveiling a new low-end model designed to take on competitors such as Silicon Graphics, Inc. "This is going to be a horrible saga," one Stardent staffer said.

The suit against Kubota was filed this month by Michels and Sanders. Neither Stardent itself nor Chief Executive Officer J. William Poduska were party to the action.

Late last week, Poduska announced that an investigation by the board, in which Kubota had cooperated, had turned up "no legal grounds for this action."

Michels and Sanders charged Kubota with having lured their former start-up, Ardent, into a shotgun marriage with Poduska's firm, Stellar; Kubota was a primary investor in Ardent. Subsequently, the two executives charged, the Japanese firm sought to siphon off the merged firm's best technology and technologists into a Kubota subsidiary.

The plaintiffs also accused Poduska of leaking to the press information calculated to force them out of the firm.

Stardent CEO
Poduska

Kubota's first response to the lawsuit contained its own zinger: According to Vice-President of Business Development Naohisa Matsuda, Michels and Sanders turned to the court only after an attempt to turn their gripes into gold had fizzled. Matsuda charged that the lawsuit was filed after Kubota rebuffed attempts by Michels and Sanders to obtain multiyear, multimillion-dollar consulting contracts in return for not going public with their charges.

Kubota officials have broadly hinted that the firm will take legal action against Michels and Sanders.

Insiders said that the amount of time, money and energy a lawsuit of this nature typically entails will deflect critical energies from the firm's product line, which is reportedly beginning to sell well.

The Michels/Sanders charges raised some eyebrows among sources close to Stardent. "The only people who fulfilled their part of the bargain" was Kubota, said one seasoned industry observer familiar with the Stardent operation. "They provided the money and did a beautiful job of manufacturing. They did everything they were asked to do."

The source's sentiments echoed the reactions of executives at other firms partnering with Kubota. "We continue to have an excellent relationship with Kubota," said Robert Miller, president of Mips Computer Systems, Inc.

Peter Behrendts, president of Boulder, Colo.-based disk drive vendor Exabyte, in which Kubota holds an approximate 8% stake, said he has "no fear at all" that customers would shy away from Kubota-linked firms. He did admit to some initial concerns. "To be honest," Behrendts said, "I expected quite a few calls — but they haven't come."

Frodo Baggins: Rising from the dead

BY MICHAEL ALEXANDER
CW STAFF

When Frodo Baggins, the central character in *The Lord of the Rings* trilogy written by J.R.R. Tolkien, comes to life on Sept. 22, personal computer users may weep. That is the trigger date for the 4096 PC virus, a potentially destructive virus that signals its presence by displaying the message "Frodo lives."

The 4096 is designed to activate on Frodo's Sept. 22 birthday or any day after it, but some DOS commands may cause it to activate ahead of schedule, said James Rich, owner of James Rich Computers in Corsicana, Texas.

The 4096, named for its 4,096 bytes of code, is one of the latest generation of "Stealth" computer viruses, designed by their authors to avoid detection, much as the Stealth bomber is designed to elude enemy radar systems, according to Raymond Glath, president of RG Virus Software Systems, Inc. His firm, based in Willow Grove, Pa., publishes antivirus software.

"The virus was written by someone with extensive knowledge of the internal workings of the DOS operating system on the PC, as well as knowledge of the detection techniques used by many of the current antivirus products," Glath said.

The virus has a number of sophisticated features, including the ability to remove itself from an infected program file if the file has been called by an antivirus program for examination, Glath added.

"It can cause havoc in many environments that run other memory-resident programs," warned John McAfee, chairman of the Computer Virus Industry Association and president of Interpath Corp., an antivirus software publishing firm based in Santa Clara, Calif. In some instances, the 4096 may wipe files from a hard disk. At other times, it may prevent the computer from booting or cause a PC to "hang."

The virus is prolific and eventually infects every file that is opened. If the virus is in memory when the user runs a virus scanning program, for example, it will append itself to every program file on the system.

The virus is believed to have first been discovered in Israel about nine months ago by members of the Israeli Defense Forces, according to Glath, who recently published a white paper on this latest generation of viruses.

In the U.S., it was first discovered to have infected PCs at Washington University in St. Louis nearly six months ago and has since been reported at over 100 sites involving many thousands of computers, according to McAfee. Other recent infections include 13 Burger King franchises in Scotts Valley and Santa Cruz, Calif., numerous Internal Revenue Service offices in Seattle and a bank based in Houston, McAfee said.

The number of reported infections by the virus is "escalating but not rampant," McAfee said.

Convicted hackers to testify against editor

BY MICHAEL ALEXANDER
CW STAFF

CHICAGO — Three surprise witnesses and admitted criminal hackers are expected to testify for the prosecution in alleged hacker Craig Neidorf's trial, which begins today in Chicago's federal district court.

The witnesses, Robert J. Riggs, 21, Adam E. Grant, 22, and Franklin E. Darden, 24, pleaded guilty on July 10 and 11 to charges stemming from their roles in a scheme to break into computers at Bellsouth Corp. in Atlanta and steal documentation from a 911 emergency telephone system.

Neidorf was indicted with Riggs earlier this year on charges of wire fraud and transporting stolen documents. However, Neidorf has contended that he was not involved in the electronic burglary.

Neidorf published the documentation Riggs stole in an electronic hacker newsletter, said Sheldon Zenner, Neidorf's attorney at the Chicago law firm of Katten, Muchin & Zavis. Neidorf, who has used the moniker Knight Lightning on computer bulletin boards, is the co-editor of "Phrack."

In several motions for dismissal of charges, the defense has asserted that Neidorf's arrest and the seizure of his computer equipment is a violation of his First Amendment right to free speech, Zenner said.

The trial has attracted considerable attention because of the involvement of Lotus Development Corp. founder Mitch Kapor's Electronic Freedom Foundation (EFF), which is paying a New York law firm to assist in Neidorf's defense [CW, July 16].

The EFF filed a friend of the court brief in support of the defense's motion for dismissal on First Amendment grounds two weeks ago. The EFF's motion was denied, but the court allowed the defense to adopt the brief as its own, Zenner said.

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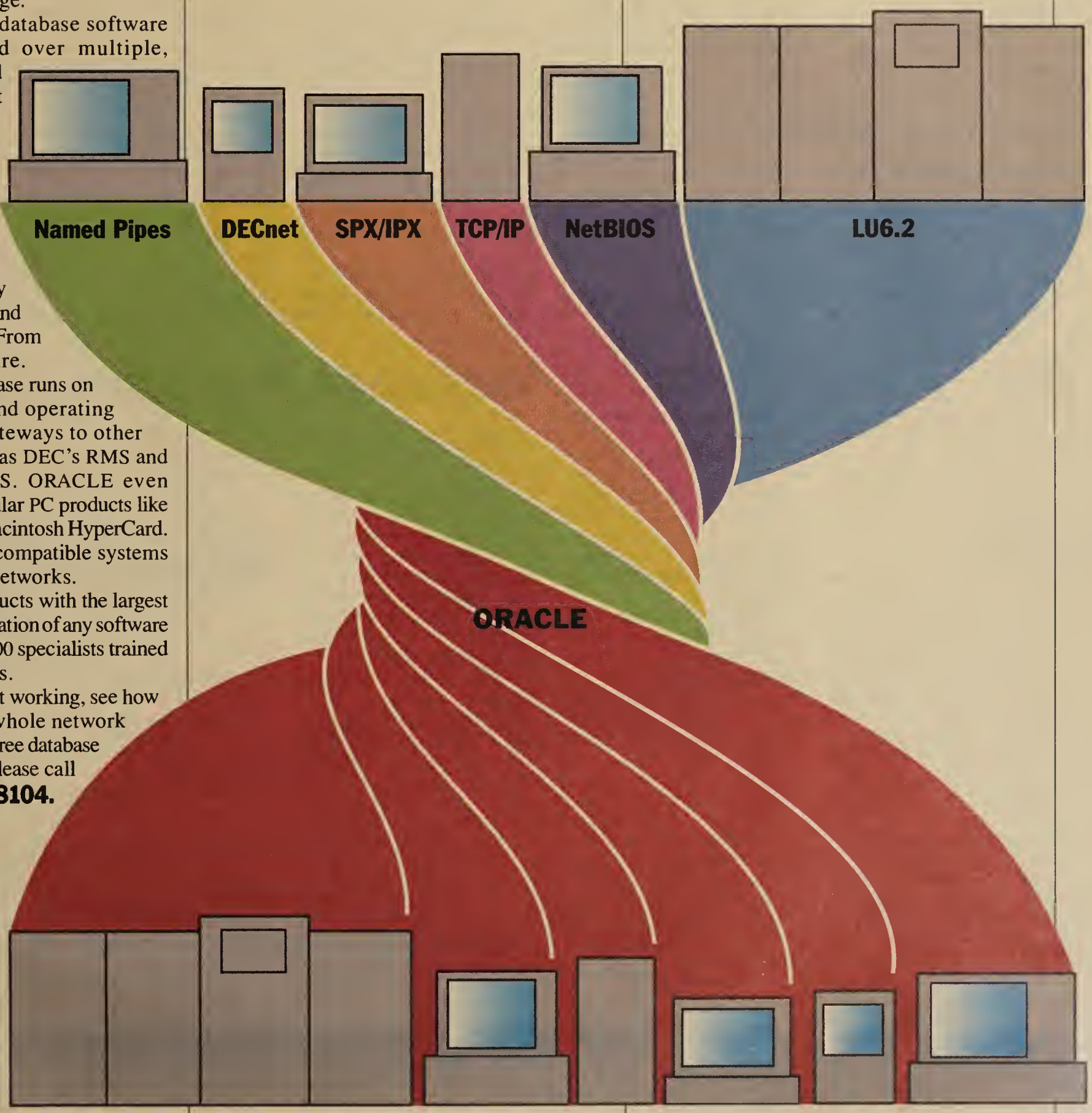

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VSE gets jumpstart with sequel

BY JOHANNA AMBROSIO
CW STAFF

SOMERS, N.Y. — IBM's VSE users may have lost a few skirmishes along the way, but it appears they have finally won the war. IBM executives interviewed last week labeled VSE a "strategic" product and said a major new version of the operating system will be introduced by the end of the year.

IBM's strategy, according to Kurt Geier, IBM's manager of systems management planning at the VSE development laboratory in Boblingen, West Germany, now includes the following:

- Helping users break out of existing VSE constraints by means of the new version of VSE.
- Committing to future VSE development.
- Positioning VSE as a sort of "little brother" to MVS and making it more compatible with MVS, partly by means of a new organization that oversees development at the key laboratories for both operating systems.

"You'll see when we position VSE at the announcement that it will be positioned with our other strategic operating systems," said Peter J. Tarrant, IBM's director of enterprise systems marketing.

The new VSE version will be announced in the fall, sources said, and will bring with it a name change. IBM confirmed that it will be called something other than VSE Version 5.1.

IBM announced plans for a new version of VSE a year ago, but there were lingering doubts in users' minds about what it meant for VSE's future [CW, July 10, 1989]. These doubts had been fed by IBM's reluctance for several years to enhance VSE.

Users no longer seem doubtful about VSE's future. Charles Rice, data processing manager at Carolina Steel Corp. in Greensboro, S.C., said, "It's been a long, tough fight. But now I feel very comfortable with VSE, and the other users I know do, too, through at least the end of this century."

Ben Parke, president of Guide International in Chicago, said: "This fulfills a lot of our users' requirements for VSE, and it's a clear signal that VSE will be in the mainstream of IBM's product line."

Pete Clark, a systems programmer at Olan Mills in Chatanooga, Tenn., said, "I'm very positive about this, and I think there are probably 22,000 happy people out there," referring to one commonly cited estimate of the worldwide VSE installed base. According to Geier, a little less than 40% of that base is in the U.S.

Users said the new VSE version will give them some practical help for the problems they have been facing. "It will help us grow our applications and our installation," Rice said.

Perhaps more important, Clark said, "instead of having to deal with the constraints of the operating system, we'll be able to develop new applications and do other things for our companies."

Geier said the new VSE version addresses the top 30 user requests, as articulated by Guide and by the IBM customer councils. Areas that will be "changed significantly," he said, include more real storage, an increased number of partitions that the operating system can address, and a larger number of I/O units that can be used. Over time, he said, users will be able to use more virtual storage. The new system will also handle native-mode 31-bit addressing.

Further, the new VSE will take advantage of the new computers that IBM will also be introducing later this year, Tarrant said. "VSE will take advantage of and exploit the new features and functions of the new hardware," he said. However, the IBM managers pledged, customers will not have to purchase new hardware or upgrade their old systems to use the new VSE.

With the new VSE and name change will come a repositioning of VSE as a low-end MVS, Geier and Tarrant said. Although both operating systems are intended for commercial on-line transaction processing, VSE is optimized for the lower end of the System/370 family — such as the 4300 and 9370 — and MVS for the higher end.

One of the "joint issues" to be resolved by the MVS and VSE development teams is a Job Control Language (JCL) that is more alike in both operating systems. Geier said IBM will smooth out the differences over time to allow for better applications portability between the two. "To the extent that new parts are added to JCL, we will make sure that they are developed to be the same. It's not likely we'll redo existing parts of JCL, because that could hurt existing customers," Geier said.

Other portability issues that IBM said it is addressing include the use of common telecommunications components and the ability to use the same disk drives for both MVS and VSE.

Also, to ease applications portability, IBM said it will bring portions of its Systems Application Architecture (SAA) to VSE. For example, Cobol2 and C will be options for VSE programmers.

However, IBM did not actually say that VSE is an SAA operating system. Instead, VSE will have interoperability with SAA operating systems but will not implement full SAA items such as Common User Access — at least not from the host.

IBM

FROM PAGE 1

Forrester Research, Inc. in Cambridge, Mass. "IBM is trying to develop strategies to deal with the shift in processing power that has occurred."

IBM's mainframe of the future will be delivered in phases during the next several years. Analysts said they believe initial capabilities will be released with the 3090 follow-on, commonly called Summit, which they expect to be announced later this year.

According to Bernard Puckett, president of IBM's Data Systems Division the future large system will have the following features:

- Coupled processors. Puckett claimed that a test version at Cornell University currently links two 3090 Model 600s that function as a single, 12-way processor complex. Analysts have expected IBM to deliver a mainframe with loosely coupled processors capable of sharing data as well as some system resources, such as expanded storage.
- Specialized processors. The goal would be to offload processing-intensive operations to a dedicated processor that could either snap into the mainframe as one or more thermal conduction modules or operate as a stand-alone box connected to the host. Puckett said operations such as database management, sorting, imaging and security and transaction processing are possibilities. It would be an extension of what IBM now offers with its vector processor for numeric-intensive operations, analysts said.
- Parallel processing. A prototype of a System/370-based parallel processor is scheduled to be delivered by the end of 1991, Puckett said. The company has built a 32-processor system based on the System/370 microprocessors.

"When I talk about large systems, I'm talking about something different than the isolated workhorse," Puckett said, adding that IBM will "very quickly have 500 [million instructions per second] systems and clusters of thousands of MIPS."

Cost-conscious

However, Matsey said the plan does not mean much unless IBM addresses the high cost of mainframe computing. According to Matsey, mainframe costs were "a third to half the reason why we've been moving applications to midranges and micros."

"I don't see the 3090 going away for at least five years," Matsey added, "but you don't have to upgrade as much each year. Eventually, it will come to no growth and then a negative."

Tom Loane, IS director at Alamo Rent A Car, Inc., is another user who said he is concerned about price.

"The ability to couple CPUs in a network of mainframes is a positive step forward," Loane said. "The question of price/performance will determine if this will be successful. It's fine and good, but it's got to have a price advantage."

Vaxstation, Decstation prices to slip

BY MAURA J. HARRINGTON
CW STAFF

An announcement by Digital Equipment Corp. last week that it will cut prices of its low-end Vaxstation and Decstation 2100 and 3100 workstations, among other products, is yet another symbol of the volatility and competitiveness of the workstation market, analysts said.

"It used to be that you could anticipate workstation prices and changes on an annual basis. Now, you can't even go on vacation without a change in the market," said Peter Kastner, vice-president of Aberdeen Group, a market research firm in Boston.

DEC's workstation price cuts — as well as cuts in prices of its memory upgrades, monitors and disk drives for the low-end models and bundling of factory-installed software in the Vaxstation 3100 — were announced for the VMS and Ultrix product lines, said Chris DeMers, DEC's marketing manager for VMS workstation products.

The price-cut announcements included that DEC will reduce the price of its Vaxstation 3100 Model 30 diskless workstation from $7,950 to $5,950 for the 19-in. monochrome monitor system and from $10,950 to $8,950 for the 15-in. color monitor system, DeMers said. DEC also will cut pricing on memory upgrades for the Vaxstation and Decstation 2100 and 3100 products to $250 per megabyte, DeMers added.

Good stuff cheap

A sample of the recent price slashes on DEC's workstation lines

digital

Price-reduction highlights

- Vaxstation 3100 family of workstations now starts at $5,950 (was $7,950)
- Vaxstation and Decstation 2100 and 3100 workstation upgrade memory now $250 per 1M byte (was $600)
- Memory upgrades for the Decstation 5000 now $550 per 1M byte (were $1,400)
- Factory-installed software for the Vaxstation 3100 workstation family, allowing unbox-to-login in 15 minutes. Factory installed software for Decstation workstations expected shortly

CW Chart: Paul Mock

"In all honesty, this really turns out to be a leapfrog [move] in the industry. We really see the workstation industry opening up for us . . . and I think that these offerings are very competitive," DeMers said.

While the price cuts may not be considered earth-shaking news to workstation users, analysts said, they represent a necessary strategic move for DEC, which they said is facing more competition than ever since IBM announced its RISC System/6000 workstation last month.

Chuck Barney, an analyst at Workgroup Technologies, a market research firm based in Hampton, N.H., said DEC, Hewlett-Packard Co. and HP's Apollo division are all likely to lose some of their present workstation market share to IBM's RS/6000.

However, IBM probably will not leapfrog the two firms in market share by 1993 [see chart] if DEC and HP as well as its Apollo division continue their competitive strategies, Barney added.

"Workstation prices are falling fast across the board, so really, [vendors] almost have to keep slashing prices to stay in the same arena as their competitors," said Martin Ressinger, a vice-president at Duff & Phelps, Inc., an investment research firm in Chicago.

While the price cuts may seem like just another typical day in the fast-paced workstation arena, Ressinger noted that the market is so competitive that users — faced with price decreases and workstation products coming out almost every month — are no longer taking the first offer that comes along.

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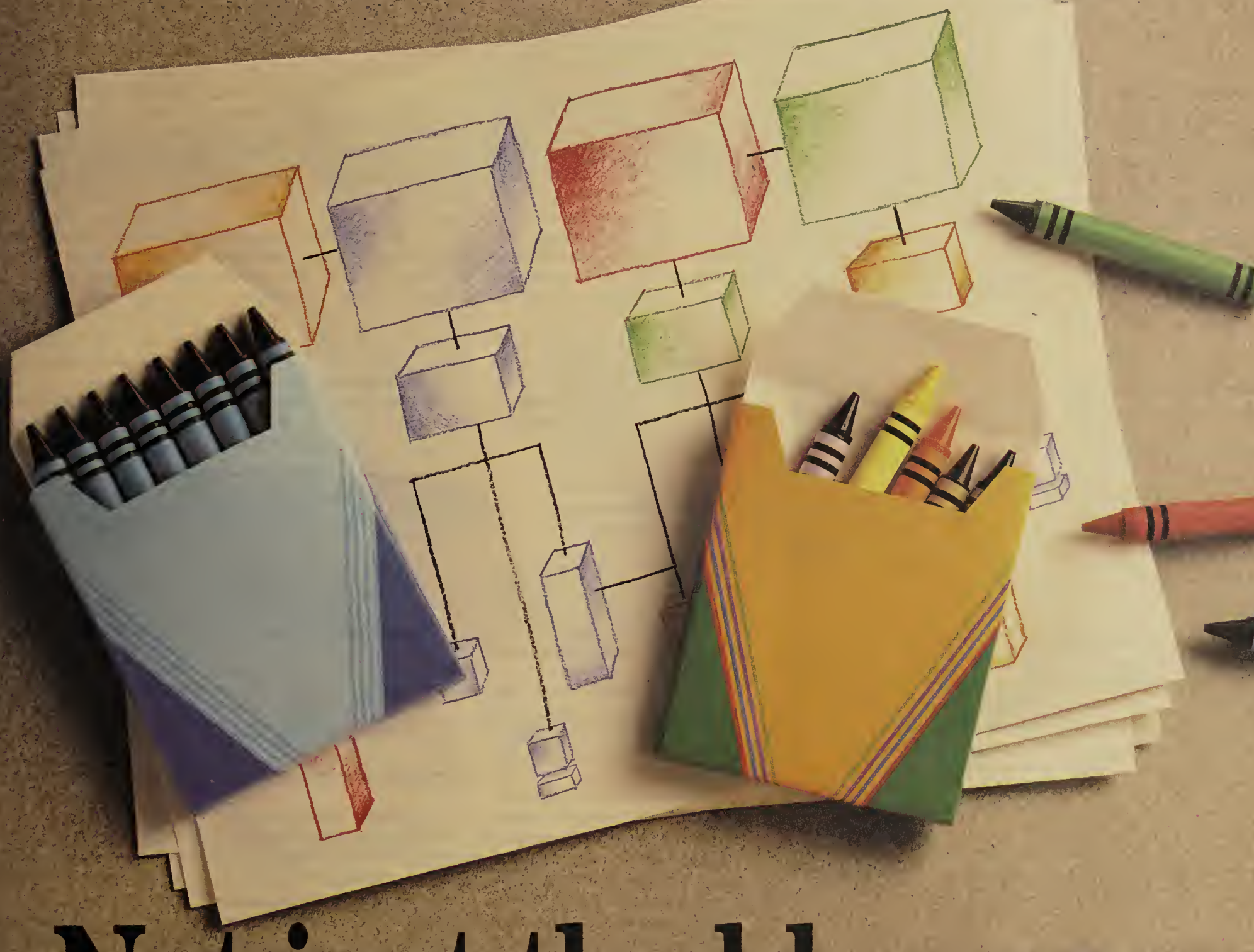

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NEWS SHORTS

IBM rings up 'No Sale'

Published reports that IBM is considering the sale of its marginal businesses, such as electric typewriters and keyboards, may or may not be true, according to IBM. The company said in a prepared statement that it had not completed any transaction such as the one reported in *The Wall Street Journal* and elsewhere. However, the company neither confirmed nor denied that it was talking to an unidentified buyer, as reported by the *Journal*. The newspaper also reported that sales such as the one said to be under consideration are often followed by employee layoffs. IBM will not modify its long-standing full-employment practice, the company said in its announcement.

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Senate looks at Euronets

The Senate Banking Committee has added a key provision on telecommunications to the Export Administration Act, according to the Computer and Business Equipment Manufacturers Association (CBEMA). The amendment, which was introduced last week by Sen. John Heinz (R-Pa.) and Sen. Tim Wirth (D-Colo.), is designed to ensure the availability of wide-area networks for computer systems sold in Eastern Europe, among other areas. "Wide-area networks that integrate computers at different sites are essential to Eastern Europe's commercial and democratic development," said William A. Maxwell, vice-president of CBEMA.

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Service awards $138M pact

Martin Marietta Corp. snagged a $138 million contract from the U.S. Postal Service to build 614 high-speed sorting machines that will process letter mail by reading and sorting preprinted bar codes. The machines, which were developed jointly by Martin and National Presort, Inc., are operated through a computer interface using real-time window displays of system status and command menus. A spokesman for the defense contractor called the win an important signal of Martin's move into the civilian sector.

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Emulex adds server

Emulex Corp. last week introduced a modular networking server that will reportedly allow network access for up to 128 users. The Performance 8000 Communications Server for the Ethernet local-area network market is expandable to allow different types of communications interfaces to be added in the future by means of plug-in controller boards, which could include interfaces to WANs. Costa Mesa, Calif.-based Emulex said the product also features high-speed data-transfer rates, printer sharing capabilities, redundancy in several component areas, extended security and a hot-swap capability that allows repair without shutting down the server. The base product with one 32-port terminal controller board costs $11,500.

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Sprint parent hit by loss

United Telecommunications, Inc., the majority shareholder in US Sprint Communications Co., reported a 55.1% decline in its second-quarter earnings. The Kansas City, Kan.-based firm said it would lay off as many as 1,300 employees from its work force. The cuts will include some data processing personnel, the firm confirmed last week. The trouble at Sprint has apparently led parent United Telecom to delay — but not terminate — its plan to purchase the balance of Sprint from GTE Corp.

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AT&T offers price info

AT&T last week belatedly provided pricing and availability information for the switched 384K bit/sec. service it introduced in May. The Accunet Switched 384 Service is scheduled to become commercially available on Sept. 1 and will initially be supported on 29 AT&T service nodes, with additional nodes to be phased in gradually, AT&T said. Pricing for the 384K bit/sec. service depends on distance and time of day, with a connection of 125 to 292 miles during the day costing $.725 for the first 30 seconds and $.095 for each additional six seconds.

More news shorts on page 116

Earnings bring no surprises

BY NELL MARGOLIS
CW STAFF

Second-quarter computer company earnings raised many smiles but few eyebrows last week as largely upbeat numbers hewed to well-marked trends rather than setting new ones.

Among the computer industry dictums once again validated in the recently closed quarter, "Give the people what they want" loomed perhaps the largest. Storage Technology Corp.'s well-received 4400 Automated Cartridge System spearheaded a second-quarter revenue surge of 17% for the Louisville, Colo.-based company. Improved service also added to Storage Tek's $197.7 million in sales, Chief Executive Officer Ryal Poppa said. Profits of $4.4 million marked a 263% boom over net income during last year's comparable quarter.

Lotus Development Corp. thundered in with a 33% revenue increase to $175.2 million and net income that skyrocketed 128% from last year's comparable period, to $23.5 million.

However, Lotus Chief Financial Officer Robert Schechter struck a note of caution with regard to "a clear understanding of the challenges we face in the second half and beyond."

Ashton-Tate Corp., still plagued with delays in getting its new Dbase product — which users clearly want — out the door, watched its second-quarter revenue drop 19% to $48.1 million and reported a quarterly net loss of $12.6 million.

Fault-tolerant systems player Tandem Computers, Inc. reported revenue of $472 million — a 12% increase over the $420.7 million it reported for the second quarter of 1989. Net income rose 160.5% to $11.4 million.

The revenue climb was less than anticipated, said Jean Orr, an analyst at Labe, Simpson & Co., because the company lost sight of economic realities. "Tandem was a little too optimistic," Orr said. Owing to "slower economies around the world, demand was slower than expected." Tandem also neglected that business world chestnut, "The bigger you get, the slower you grow." Aiming bigger — and bigger-ticket — equipment at new target markets rendered the firm more sensitive to the vicissitudes of the economy than was previously the case, Orr said.

Repositioning woes continued to show at Unisys Corp., which reported that revenue decreased 4% from last year's second quarter, to $2.4 billion. Net income of $11.8 million was down 78% from 1989's second-quarter profit figure. "I wasn't thrilled," said Rick Martin, an analyst at Prudential Bache & Co., referring to the revenue backslide. Nevertheless, he noted, Unisys is "still on target for 2% to 3% growth for the year."

Martin took a patient view of the struggling titan. "This is a company going through lots of restructuring," he said, echoing analysts' comments about Unisys for many consecutive quarters now.

Senior writer Richard Pastore contributed to this report.

Unisys

FROM PAGE 1

claimed it is the first production mainframe to employ the MCA chip, although analysts pointed out that Digital Equipment Corp. also uses the chip in its high-end VAX 9000.

Each MCA-III chip has 10,000 emitter-coupled logic (ECL) gates; the MCA-I, used in Unsiys' A12 and A, sports 1,200 ECL gates.

Thanks in part to the new chip, the A16 has performance specifications that, according to Unisys, "equal or exceed" that of the high-end A17 on many operations, and with 384M bytes it has more memory capacity than the A17. The new chips and packaging also enabled Unisys to shrink the size of the new box: The air-cooled A16 occupies just 9.6 sq ft, compared with 38.4 sq ft for the A17.

Replacement strategy

Jim Cassell, vice-president and service director for large systems at Gartner Group, Inc. in Stamford, Conn., rated the performance of the A16 as equivalent to that of an IBM 3090 Model 180-J. He said the latest system sets the stage for a replacement strategy for the current high end of the Unisys A Series.

However, Cassell said, Unisys is "introducing it in a way that minimally disrupts their installed base." He noted that while the A16 is clearly capable of supporting a three- or four-processor architecture, Unisys has currently announced only one- and two-processor models. This, he said, will keep current users of three- and four-processor A17s happy but, at the same time, point the way for all future migration.

Current A Series customer and former Cube user group President Robert H. Dever III also said the A16 anticipates a high-end machine in the wings.

"Sounds to me like they're getting ready to get rid of the 17 or ride it over the sunset," said Dever, who is also vice-president of information services at Liberty Travel, Inc. in Ramsey, N.J. He said the A16 is less a gap filler and more a "gap preventer," designed to fill the space between the current A Series and some as-yet-unannounced high-end box.

"Our view is [that the A16 is] a good announcement for Unisys' installed base," Cassell said, although he added that it remains to be seen whether the "totality of the offering" will enable Unsiys to gain market share against IBM for high-end 3090-class customers.

However, it was the DEC 9000 that attracted the most pointed comparisons from Unisys executives.

"We think we have more performance in one-third the footprint," said Chuck McIntyre, program development manager for the A Series.

Beta-test site customer Chuck Spooner, data processing manager at Roseville Telephone Co. in Roseville, Calif., said he has been delighted with the A16 Model 511 he received May 15.

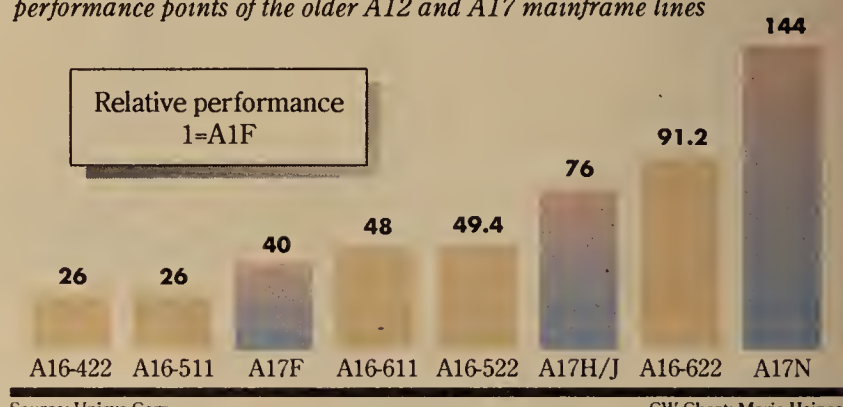
The telephone company, located 16 miles east of Sacramento, has been using its A16 as a test and development platform and as a disaster recovery processor for the A12 mainframe at its data center seven miles away.

Spooner said he is particularly excited about the prospect of upgrading the mainframe to a dual-processor system.

The two single-processor A16s are available immediately; the three dual-processor models will be ready in October, according to Unisys.

Enhanced lineup

The A16 line, priced from $1.75 million to $5.9 million, spans performance points of the older A12 and A17 mainframe lines



Source: Unisys Corp. CW Chart: Marie Haines

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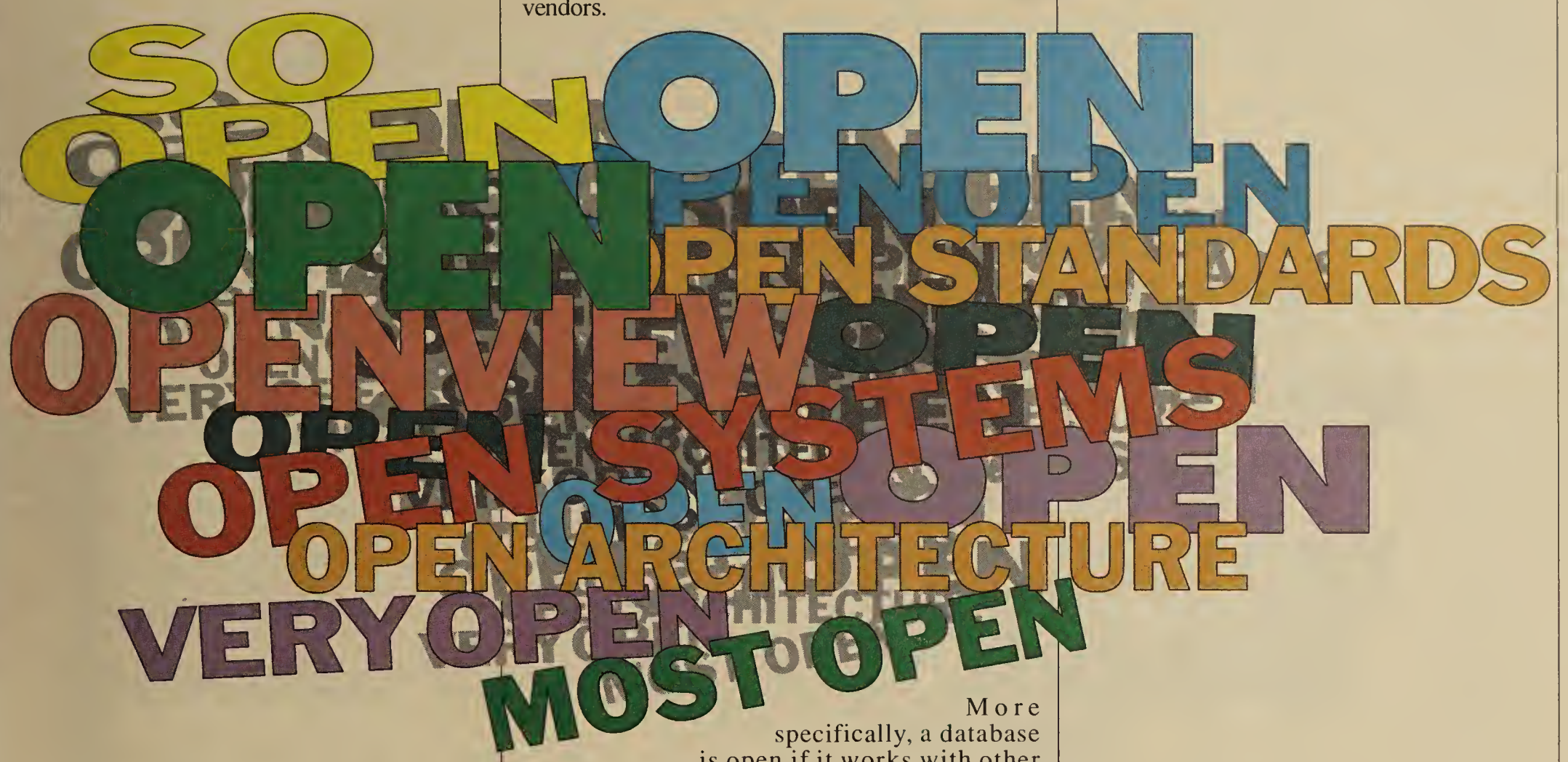

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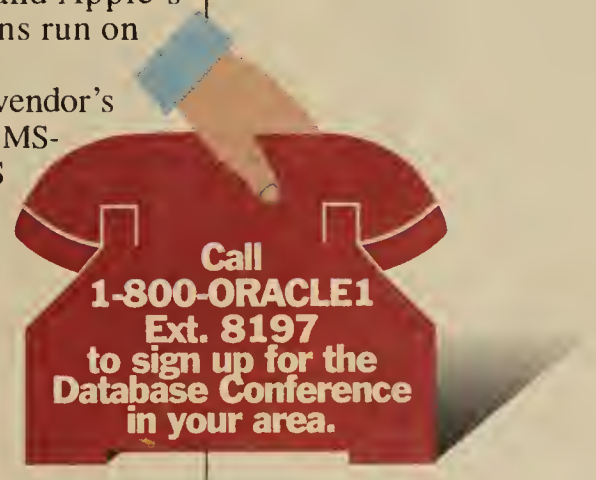

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Compaq's Systempros lean into 486 power curve

BY RICHARD PASTORE
CW STAFF

HOUSTON — Compaq Computer Corp. revved up its Systempro series to full 486 power and fleshed out its Extended Industry Standard Architecture (EISA) desktop line with an upgradable introduction last week.

Compaq delivered on its promise of Intel Corp. I486 dual-processor power, delivering Systempro models based on the 33-MHz 486 chip as well as a 486 upgrade board for the few Systempros that have sold with Intel 80386 CPUs.

The 486 booster comes about a month later than promised, according to new product manager Lorie Strong. Design and testing delays held up the debut, she said. The lag also may have retarded Systempro sales, observers added.

"If I were putting in a Systempro, I wouldn't dream of putting in anything but a 486," said Seymour Merrin, president of Merrin Information Services, Inc. in Palo Alto, Calif. "I think you'll see a substantial pickup once the 486 is out." As of May, only 2,543 Systempros had been sold through U.S. computer specialty stores, according to Storeboard/Computer Intelligence in Dallas.

The native 486 systems will ship with 240M-, 420M- and 840M-byte disk drive arrays and will cost $20,999, $23,999 and $29,999, respectively. The upgrade board costs $6,999. Shipments are scheduled to begin this month.

Though Compaq cut prices on the 386-based Systempros by 12% to 15%, the company said it expects the native 486 models to be the better seller in the long term, Strong said.

The company also promised a storage boost within the next 12 months that will jack disk capacities from the current 1.68G bytes to over 10G bytes. "Our long-term direction is to provide over 40G bytes of storage," said Mike Swavely, Compaq president for North America.

Analysts said increased storage is essential to the success of the line. "If Compaq wants to position the Systempro as a network server, it has to support substantial amounts of storage," said Michael Goulde, vice-president of Open Systems Advisor, a consulting firm and newsletter publisher in Boston.

Compaq also announced two Deskpro machines based on EISA. One, the Deskpro 386/33L, allows users to swap the 33-MHz 386 CPU for a 33-MHz 486 board. The upgrade module costs approximately the same as the difference between the prices of the 386/33L and the Deskpro 486/33L, which also debuted last week.

In the past, Compaq has criticized the concept of upgradable personal computers offered by some competitors. Upgrading the CPU rather than buying a whole new box leaves users with mongrel machines hampered by slower disk drives and memory components, Compaq said.

Despite the new upgradable Deskpro, Compaq is sticking to its guns — sort of. "We would still be resistant to upgrading over a broad range," from an Intel 80286 to a 486, for example, Strong said. "Then you'd be so out of whack in the size of the machine and the drives."

The Deskpro 486/33L ships with 120M-, 320M- and 650M-byte hard disk drives and is priced at $13,999, $16,499 and $19,499, respectively. The 386/33L ships with the same drive configurations and costs from $9,999 to $15,499.

AT&T's Unix unit spun off

BY JOHANNA AMBROSIO
CW STAFF

MORRISTOWN, N.J. — AT&T has completed the spinoff of its Unix Software Operation into a new entity that is completely separate from the hardware development unit.

The software group, renamed Unix System Laboratories, Inc. (USL), is now a subsidiary of AT&T instead of being a business unit of AT&T's Data Systems Group. "This allows us to formally distance ourselves from AT&T's computer systems business," a USL spokesman said. "Now, we're just one of their customers, and they're just one of ours. Our focus is to supply Unix source code to the entire computer industry."

There has been speculation that this new relationship will also allow AT&T's hardware group to more gracefully adapt the Open Software Foundation's standards, including the Motif user interface.

Top management at USL remains the same as it was in the Unix Software Operation. Larry Dooling is president, and other top executives include Michael J. DeFazio, vice-president of Unix System V software, and Joel A. Appelbaum, vice-president of open solutions software. This category includes AT&T's Tuxedo transaction processing monitor for Unix.

The "big story" about USL will likely come later this year, the spokesman said, when USL offers equity to other major players in the Unix world. USL is planning to keep 70% of the company for itself and its employees, and it will offer 30% to outside interests, according to the spokesman.

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U.S. flat-panel display firms decry Japan pricing

BY NELL MARGOLIS
CW STAFF

WASHINGTON, D.C. — A trade group made up of seven U.S.-based flat-panel display makers took a look at its imperiled industry niche last week and apparently borrowed a line from the late Bette Davis: "What a dump!"

The Advanced Display Manufacturers of America (ADMA) filed an antidumping petition against alleged unfair trade practitioners, including Matsushita Electric Industrial Co. Ltd., Sharp Electronics Corp., Hitachi Ltd. and Toshiba Corp. The group contended that it is acting to save the U.S. flat-panel display industry from extinction.

According to the ADMA's complaint, the firms named are dumping flat panels — in other words, flooding the market with underpriced flat-panel displays.

The practice is particularly threatening to young, entrepreneurial firms faced with high research and development and manufacturing costs — such as the members of the ADMA, which together have accounted for some 90% of all flat-panel display production in the U.S. since 1987.

The flat-panel display market — founded on technology originally developed in the U.S. — is widely considered to be one of bright promise. Industry observers said they see it as key to a coming scenario in which consumer electronics and computers will merge in an interactive digital video marketplace supplying a panoply of "infotainment" devices.

Figures compiled by Stanford Resources, Inc., a market research firm based in Stanford, Calif., showed the flat-panel portion of the burgeoning worldwide market for high information content electronic displays at approximately $700 million in 1989, with projected growth to the $1 billion ballpark by 1996.

The corporate mortality rate among U.S.-based flat-panel display makers in the past decade has been alarming, with 15 either closing their doors or selling out. According to a Nikkei Sangyo Newspaper Survey published in February, eight leading Japanese electronics firms plan to invest an aggregate $2.24 billion in the technology by the end of 1993.

Moreover, an ADMA spokesman said, Japanese manufacturers have made no secret of their pricing strategy. He cited an article in the Dec. 23, 1989 issue of *Japan Economic Journal* in which a Toshiba executive, referring to the flat-panel display industry, stated that "We are prepared to accept red ink for the first five to six years."

However, not even a successful antidumping campaign will guarantee survival for the shaky U.S. flat-panel screen manufacturing sector, said Norman Weizer, an analyst at Cambridge, Mass.-based consultancy Arthur D. Little, Inc. "This is something the Japanese do very well," he said. "This technology takes long-term [research and development] commitments. It takes precision manufacturing."

Go, IBM bank on pen-based tech

BY JAMES DALY
CW STAFF

Go Corp. moved to establish itself as the bearer of the de facto operating system standard in the emerging pen-based computer market with its announcement last week that IBM will be the first to license the still-unannounced software.

Both the Foster City, Calif., start-up and IBM plan to introduce models based on the fledgling technology, which allows users to enter data by writing rather than typing. However, officials from both firms refused to speculate on when these systems will become available.

"The industry will expand, but only if we rally around a standard we can all live with," IBM Vice-President Mike Quinlan said.

Go President Jerry Kaplan said that the two companies are already involved in pilot projects with selected corporate customers. Terms of the licensing agreement were not announced, however.

Kaplan said that Borland International, Lotus Development Corp., Wordperfect Corp., Slate Corp. and Pensoft Corp. are also doing development work using the Go operating system but offered no specifics on delivery dates.

The arrival of the notepad-size computers has some analysts conjecturing that pen-based computers could have an impact on the industry unlike anything since Apple Computer, Inc.'s Macintosh. Users could range from insurance adjusters visiting the scene of an accident to store clerks taking inventory.

"The pen-based market could be as large as the PC industry in the long run," Kaplan said.

Firms such as Fremont, Calif.-based Grid Systems Corp. and Boston's Scenario, Inc. have already announced pen-based computers, while Momenta Corp. in Mountain View, Calif., is reportedly readying such a system. In Japan, Sony Corp. and Canon, Inc. have pen-based systems that they will presumably export stateside in the near future.

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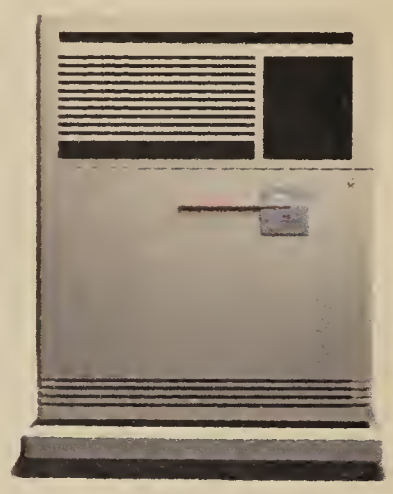

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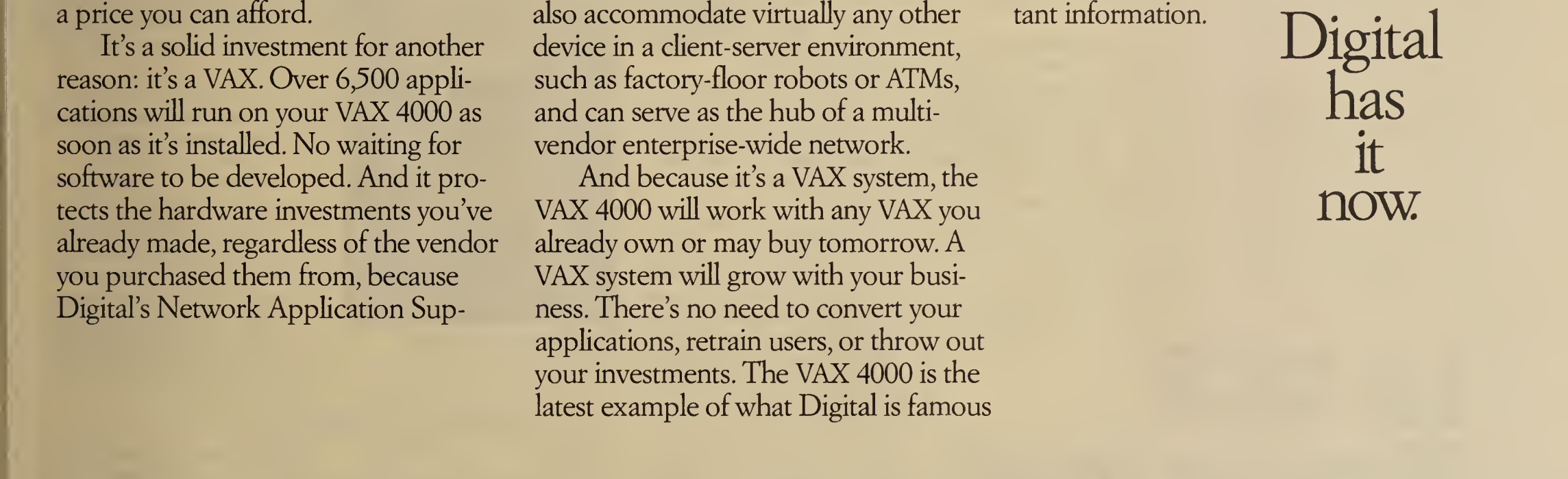

FCC aims to cut overseas rates

BY ELISABETH HORWITT
CW STAFF

WASHINGTON, D.C. — The Federal Communications Commission's (FCC) recent announcement that it would try to cut international calling costs by as much as 50% in the near future struck a major chord among U.S.-based businesses that have been restricting some types of overseas communications to keep their telecommunications budgets within bounds.

The FCC proposed to streamline the processes by which U.S. carriers implement reductions of international accounting rates. It also announced that it has "tentatively concluded that it has the authority to establish lower, more cost-based, international accounting rates."

Monopoly power

While competition among domestic carriers has steadily driven down the costs of international calls originating in the U.S., many foreign administrations enjoy monopolistic control over their countries' communications facilities and are accustomed to subsidizing other public services, such as the post office, with revenue from international calls, sources said.

As a result, the cost of directly dialing the U.S. from overseas can be as much as three times the cost of a comparable international call made from here. The disparity has resulted in an increase in the U.S.' network settlements deficit from $40 million in 1970 to $2 billion in 1988, according to the FCC.

The situation "scares us to death, to be honest," said Lazz McKenzie, principal network engineer at The Foxboro Co. The Foxboro, Mass.-based manufacturer has gotten some major economies on calls originating in the U.S. "by jumping between AT&T, ITT and other carriers out there," McKenzie said. "But when we get to Germany or Holland, we absolutely get nailed by services that are three times the price [of foreign calls originating here] and immovable," even with 1992 in the offing, he added.

A commonly practiced economy measure is to pay a set price for leased lines to other countries, and then use those lines as much as possible. General Electric Co.'s international leased-line network, for example, has both saved money and increased quality of networking as compared with dial-up lines, according to Stan Welland, GE's manager of corporate telecommunications.

Foxboro has implemented an X.25 packet-switched data network on top of leased lines to the UK, the Netherlands, France and West Germany, McKenzie said.

The private network strategy only works, however, when there is enough traffic to a given country to cost-justify such a connection. Foxboro pays Postal Telephone and Telegraph authorities (PTT) a heavy fee for the use of leased lines — about $8,300 per month for a 56K bit/sec. line to the Netherlands, according to McKenzie.

Furthermore, countries such as West Germany deliberately charge outrageous private-line fees in order to keep users on their pay-by-use public networks, McKenzie said.

The inability to put all of their communications on dial-up lines has significantly altered — and in some cases hampered — businesses' communications practices. The result is that U.S. sites are more likely to dial up overseas sites than vice versa.

In addition, companies have been discouraging the use of communications applications that make use of dial-up connections. For example, Foxboro has been encouraging its users to transmit documents via electronic mail rather than facsimile, which "goes mostly over dial-up," McKenzie said.

At United Parcel Service, Inc. (UPS) employees are being encouraged to send E-mail rather than make a telephone call overseas whenever feasible, said UPS telecommunications manager Douglas Fields: "At times, we would rather have had person-to-person communication, but it has been cost-prohibitive."

A significant lowering of PTT direct-dial charges could set off an explosion because of pent-up demand for global communications services and applications, Fields said. "You might send more information; you might make a call you wouldn't make before," he added.

However, users expressed some skepticism as to whether the FCC will be able to "set rates for a foreign entity," Welland said. "My understanding is that statements like this have been made before, and it didn't work."

Mixing and matching musical tastes

BY LAURA O'CONNELL
CW STAFF

Maybe as a kid he dreamed of becoming a disk jockey. But somehow, Charles Garvin got the notion that everyone should be able to string together their favorite songs. So he developed a computerized system to do just that — it makes personalized cassettes at a record store while you wait.

Garvin's inventive way of tapping people's musical imaginations recently earned his 5-year-old brainchild, Personics Corp., a *Computerworld Smithsonian Award.*

What Personics accomplished, said Patrice Adcroft, editor of *Omni* magazine and one of the judges for the Awards, is "an entertainment innovation. It gives people a chance to be creative."

Most people "are used to being couch potatoes and sitting mindlessly in front of a television or a radio receiver and being entertained," Garvin said. In the future, he explained, fully interactive media will get an audience involved, "but between now and then, we have a population that still is used to extremely passive acceptance of entertainment. Personics may provide a map between here and there."

The idea of distributing customized music is not new, but Garvin's approach differs in that he is attempting to cooperate with the record industry. The Personics System pays royalties to record companies and artists from whom the music is licensed. Garvin hopes that this tack will assuage their fears that personalized cassettes would cannibalize album sales.

"It both benefits the artists by opening up markets for his or her music," Garvin said, "and benefits the customer by being able to let you try out genres."

A customer gets to "try out" this music at a "listening post" in the record store, where he can sample 10- to 15-second snippets of songs. He simply punches catalog numbers into the post's keypad and hears music through headphones.

A sales clerk then enters the numbers into a squat, boxy machine behind the counter. In five to 10 minutes, out pops the cassette, complete with a laser-printed label listing the songs as well as the customer's name, copyright information and desired title.

Personics *lets customers personalize their cassettes*

This manufacturing at your fingertips is handled by a variety of computer systems.

Personics has 250 systems at 230 sites. Each system consists of an IBM Personal Computer AT-based industrial controller made by NCR Corp. and fitted with specialized boards made by Personics. The controller attaches to two compact disc jukeboxes, each containing 60 CDs specially recorded with digital compressed data to store more than three times as much music as standard discs. The 90G-byte database currently houses 4,000 to 5,000 songs but has a capacity of 8,000.

A control interface in the AT controller allows the compressed data to be decompressed and turned back into high-speed digital audio, which a modified Nackamichi Corp. tape transport records onto the cassette at eight times playback speed.

Back at Personics headquarters in Redwood City, Calif., a Sequent Computer Systems, Inc. S-81 running Unix keeps things humming. Overnight, the S-81 calls out to every controller via modem and downloads the day's sales data.

"The biggest [technical] challenge we had was to figure out how to archive a tremendous amount of music in a very small amount of physical space," said Tom Sharples, senior vice-president of engineering. Standard 16-bit CDs only hold 15 to 20 songs apiece. To overcome that limitation, Personics licensed and adapted a technique from Dolby Laboratories Licensing Corp. that offers approximately 3.2 times more efficiency to fit 50 to 70 songs on each disc.

Personics has faced more than technical hurdles. "By far, our biggest challenge has not been technical or operational but almost political," Garvin said. "It has been convincing an industry that is generally somewhat skeptical of new technology that we could increase overall revenues and royalties rather than threaten them."

So far, Personics has had measured success. Forty labels have signed on, including five of the six major companies in the U.S., and two firms with ties to record producers have provided financial backing.

"Personics has had to be quite patient with record companies putting their toes in the water rather than jumping in. But I think it's proving slowly to record companies that [Personics is] not a threat to their traditional business and in fact [will] be advantageous to them," said Stan Cornyn, president of Warner New Media, part of Time Warner Inc.

Meanwhile, Personics continues its rollout and has improvements in the pipeline. Boosting the system's recording speed and revamping the customer interface are on the agenda, as well as expanding services into channels such as mail order, telephone ordering and remote order entry.

ADVANCED TECHNOLOGY

Philips' CD-I disc slips into market

Large-capacity technology is causing other firms to follow N.V. Philips' lead

BY MICHAEL ALEXANDER
CW STAFF

While many firms have been touting the merits of multimedia on personal computers, conglomerate N.V. Philips has been quietly inching into the market with an interactive machine that has a computer built in.

The Dutch firm, which co-developed the compact disc with Sony Corp., introduced a $2,500 multimedia machine late last year based on compact disc-interactive (CD-I) discs for business users. A 5-in. CD-I disc, which can store 650M bytes of information, can carry up to 300,000 typed pages of text, 7,000 photographic-quality images, 72 minutes of full-screen, full-motion animation or 19 hours of speech.

Philips, Matsushita Electric Corp. and Sony are also collaborating on the development of an extension of CD-I to accommodate full-screen, full-motion video. That capability will be available next year, according to Gerald Calabrese, vice-president of Philips Interactive Media Systems in Knoxville, Tenn.

A CD-I player, which looks like a CD audio player, plugs into a television set and is also capable of playing back audio CDs. The machine, whose brain is a Motorola, Inc. 68000 microprocessor, is controlled by a handheld remote control and joystick.

The primary business applications for the technology are training and point-of-sale merchandising and information. One advantage of CD-I is that it is an international format, so a multinational corporation could use one CD-I, with up to 14 different languages, at any of its global branches.

French auto maker Renault is developing four CD-I discs to train its workers in troubleshooting electronics, carburetion and ignition systems. The same discs will be used by service personnel worldwide and will contain seven languages.

At least 15 firms, including Rand McNally & Co., Time-Life Corp. and Harcourt Brace Jovanovich, Inc., are developing CD-I titles. When the hardware is officially launched next year, it will be accompanied by 23 to 25 titles, said Phillip Mittleman, president of CD-I Systems, Inc., a CD-I software development firm in Los Angeles.

Earlier this year, Philips Interactive Media Corp. and Capitol Video Communications, Inc. formed an equal partnership called Capitol Disc Interactive to develop CD-I programs for the business and government markets. Capitol Disc Interactive recently inked a pact with Museo Amparo Puebla in Puebla, Mexico, to build 28 point-of-information kiosks using CD-I technology.

However, CD-I players will be aimed largely at the consumer — not business — market, Calabrese said. Ten firms, including Philips, Sony, Matsushita and Fujitsu Ltd., have announced plans to introduce CD-I players, slated to sell for about $1,000, to the consumer market next year.

Robert Pizzo

Sales of industrial and consumer CD-I players will top off at 4,000 units this year and climb to 35,000 units in 1993, according to Venture Development Corp., a market research firm based in Natick, Mass. In comparison, sales of consumer units will climb from 30,000 to 600,000 in the same period, the firm predicted.

The Japanese may ultimately have the edge in multimedia, thanks to their considerable control over the U.S. consumer electronics market. They are already the top suppliers of CD drives, computer monitors and color television sets. With an immediate foothold in the consumer market, the economics mass production will enable then to step up into the business world with a computer-controlled multimedia machine that is far less expensive than competing products.

CD-I has flaws that could hinder its acceptance, especially among consumers, analysts said. "One of the missing pieces is full-motion, full-screen video," said Walter Miao, vice-president of technology at Link Resources, Inc., a market research firm in New York. "The biggest stumbling block is a lack of software and tools to develop CD-I programs."

Miao also said that a competitive technology, Intel Corp.'s digital video interactive, may prove to be more alluring to businesses than CD-I.

The two interactive media can easily co-exist in business, and CD-I's lower cost "will be a tremendous advantage," Calabrese said. "Not every application, even in a computer environment, is computer-dependent."

SAIC designing mind-reading computer

BY JIM NASH
CW STAFF

Scientists are nearing completion of the first commercially viable computer capable of imitating rudimentary human thought.

This marks the next step in artificial intelligence's evolution, up from the endless quest for the best thought-duplication method. A San Diego-based defense contractor, Science Applications International Corp. (SAIC), is designing an artificial neural system based on integrated circuits that can learn by doing, without the assistance of a human operator.

The goal is to build a fast, portable computer that can learn from its experiences by developing its own problem-solving algorithms. Such a machine would be used for image, sound and pattern recognition in military and industrial settings. A chip capable of learning might be taught to look for enemy aircraft or cancer cells, for example.

Biomedical research involving image recognition at the University of California at Davis uses first-generation artificial neural systems. Wasyl Malyj, chief development engineer at the campus' veterinarian medicine serology lab, said his program could benefit from dynamically learning chips. Today, he uses an SAIC neural accelerator board on a personal computer to trace horse bloodlines by classifying blood cell characteristics.

Although satisfied with the 97% accuracy rate currently achieved by the equipment and his staff, Malyj said he will opt for neural chips that can reprogram themselves once they are proven and available commercially. Malyj said he expects the technology to do the work of six technicians who now look at 12,000 images of blood components each day.

Casey Klimasauskas, president of Neuralware, Inc. in Pittsburgh, develops software used to design nonlearning chips. Klimasauskas acknowledged the commercial importance of learning chips but said that military needs were receiving just as much attention. "The military needs to be able to write somebody's name on a bullet, fire it — fire it anyplace in the world — and have it hit that person in the head or the heart," he said.

Conilee Kirkpatrick, senior scientist on the neural chip project at SAIC, said, "By first showing it a processed image of an object and telling the computer what it is, the new neural chip would learn key features to look for in the future. Using degraded images of varying degrees," she added, "the computer would become more adept at picking out distiguishing features."

Problem-solving expert

Most important, however, is the computer's ability to solve novel problems on its own based on its training and subsequent operating experience, said Derek Stubbs, editor of "Neurocomputers" in Vicksburg, Mich. Previously, Stubbs said, neural chips had to be taken off-line and reprogrammed to deal with new situations.

According to Mickey Williamson, an author and consultant in Warwick, Mass., artificial neural systems (neurocomputers) write their own problem-solving algorithms based on what they have dealt with before. Williamson said SAIC's decision to go with artificial neural chips is significant, and companies are becoming more confident with the once-unfathomable science behind thought-process imitation. The firms are beginning to base products on systems designed thus far, Williamson said.

"Rather than try to delve into the secrets of the universe, we're making a real product," Kirkpatrick said. The firm's first commercial artificial neural chip products could come in early 1992, SAIC officials said.

Beyond the obvious advantages of having a computer that does not shut down when it reaches a novel situation, SAIC's chip would offer size and speed benefits — both critical to potential military and commercial markets. Being compact, the system would be portable and more easily hooked into a network of other neural chip computers.

Kirkpatrick said that prototype chips hit processing rates of about 150 million connections per second in recall — or nonlearning — mode and 64 million data updates per second. They are 20 times faster than SAIC's commercially available neural network accelerator boards.

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EDITORIAL

Trying times

IN *The War of the Roses,* Danny DeVito's character asks, "What do you call 5,000 lawyers at the bottom of the Atlantic Ocean?"

Answer: A good start.

OK, OK. So lawyers are an easy target, but the joke seems appropriate these days, given how a lot of us must be feeling about the industry.

Consider that three of the biggest news stories of the past three weeks have concerned a contentious patent dispute between Motorola and Hitachi, a decision in the four-year Lotus "look and feel" ordeal and a bitter lawsuit between two Stardent executives and the company's major investor.

That's in addition to the myriad pending copyright lawsuits that have been filed during the last two years, the countless class-action suits that are filed by shareholders every time a company's earnings surprise investors, users suing vendors for failing to solve their problems, vendors suing developers for planting logic bombs in programs, vendors suing vendors for theft of trade secrets and so on.

What's going on here? This little industry has become a $260 billion machine, that's what. And in the process, it's litigating itself to death.

Not too long ago, the high-tech headlines were dominated by stories about technical breakthroughs and the ever-expanding markets for computer technology. Sure, there was the stray antitrust suit here and there, but there was still plenty of money to be made and more niches to fill than there were niche-fillers to go around.

Look around today. There are darned few niches left to be found (when was the last time you saw a personal computer software package that truly defied classification?); the big guys are holding on jealously to the positions they've got; and industries in decline are now looking to their legal departments for revenue that their research and development departments can't give them.

Texas Instruments, for example, has practically made a business out of suing chip competitors for patent infringement. IBM dusted off every PC patent it could find two years ago and used them to extract fees from clone makers. Lotus' attempt to vigorously protect its intellectual rights says as much about its inability to produce new breakthrough products as it does about the value of an interface. Apple's $5 billion weight rides squarely on the look and feel of the Macintosh, and it won't let Microsoft forget it.

Lawsuit mania is nothing new to American business. Practically every industry has gone through a similar phase as the competition shakes out and the big players stake out their turf. Unfortunately for U.S. companies, this latest round comes just as Japan is making highly visible progress in its campaign to become a high-tech innovator. Meanwhile, the largest U.S. companies are diverting R&D dollars into their legal budgets. Creativity often suffers when the lawyers get involved.

LETTERS TO THE EDITOR

Money talks

Corporate executives are no different from your 3-year-old child when it comes to behavior modification. You need to find out what motivates them.

For those reading Hugh Watson's "Avoiding hidden EIS pitfalls" [CW, June 25], I would like to share a personal philosophy. You can modify a person's behavior either by modifying their compensation or by providing them with a tool to facilitate performance improvement that will bring about increased compensation.

So, if you are looking for a champion for your executive information systems (EIS) project, find out how they are compensated and structure your project accordingly. Remember that most executive incentive compensation plans change periodically, depending on corporate goals, so modify your system to support these changes.

I will guarantee you that if your EIS efforts make it easier for the executives to earn increased compensation, you will have no problems getting the support necessary to develop and maintain an EIS. They won't let you fail if you satisfy their requirements.

Roger Nelson
CMS Professional Resources
South Bend, Ind.

Soviet strategy

Regarding your editorial "Talk is cheap" [CW, June 11], which discusses the ramifications of selling U.S. computer equipment to the Soviet Union at reduced prices, the emphasis was on buying and selling.

In the world of business today, some of the most important words used are "negotiate" and "compromise." Why, then, do the vendors not lease the computer equipment to them, with a buy option? With sophisticated Soviet programming services or Western-based programming services and the Soviet transfer to a market economy, a vast uncharted market could be better explored.

Business process development based on profit motivation is the key to highly effective utilization of any hardware and software programming service. This lack of business process knowledge will vastly decrease the efficiency of any capital expenditure, regardless of the capital application methodology employed. American understanding of this business process services the need for U.S. persons to be employed in this capacity.

Shows of good faith on both the U.S. and Soviet sides would increase the chance of global peace and productivity. Ultimately, this should be our common goal.

Chris James Michael
Vice-President of operations
Anna Christine Michael
Recruiter
Unisoft Corp.
Raleigh, N.C.

Kiitos very much

In "Password puzzlers" [CW, June 11], you suggested using words from other languages as passwords. I don't disagree with that suggestion.

However, you made an error in your spelling of the Finnish word for "thank you." It is not spelled *kiipos* as you have shown, but rather it is spelled *kiitos.*

As for the suggestions in the article, they are excellent. Although I don't have the same need for intricate passwords now, I did need them while I was a university student. One of my favorite tricks was to make palindromes, such as turning sin into sinnis or eng (short for engineer) into enggne.

Continue with these fine suggestions, but watch your spelling.

K. Matias Rautapuro
Environmental Group
Dearborn Chemical Co. Ltd.
Mississauga, Ontario

Slow going

Regarding your "Inside Lines" column [CW, June 18], while it is true that I am no longer associated with ACF2 or Computer Associates, I would like to point out that I left ACF2 in good hands with CA. The decision to leave and found a new company was both long and difficult, and throughout this time CA was very understanding. When I finally did decide to leave, CA — although disappointed — was very supportive. My so-called "bolt" was a long and slow one, but I certainly would not have left if ACF2 was not being properly looked after.

ACF2 will be just fine — even without me.

Eberhard Klemens
President
Eberhard Klemens Co.
Naperville, Ill.

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In search of a universal library

JANE RYLAND

We are taking the first steps toward the creation of a virtual library, which could ultimately make the knowledge resources of the world accessible to every desktop workstation belonging to scholars, researchers, faculty members, administrators and students. This library will reach beyond colleges and universities to business and industry as well.

For information systems managers, it is easy to envision a world in which all publications are captured, organized, indexed and stored on magnetic or optical disc, available for computer search, access, display and print as readily as our internal databases. In fact, many organizations have begun to investigate the collection, acquisition and distribution of multimedia databases using optical-disc technology, especially compact disc/read-only memory.

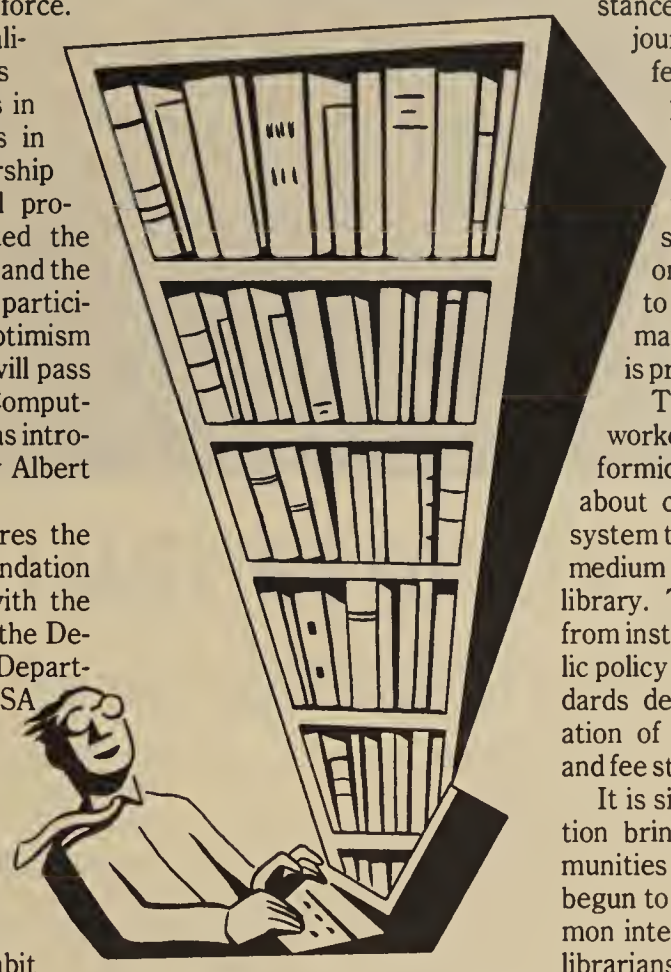
Making this vision of the virtual library a reality is the primary objective of the recently announced Coalition for Networked Information, a project of three organizations — the Association of Research Libraries, Cause and Educom — whose members represent IS and academic computing professionals at colleges, universities, major research libraries and corporations. Since its formation in March, more than eight institutions and organizations have joined the coalition's task force.

The mission of the coalition is to promote access to information resources in networked environments in order to enrich scholarship and enhance intellectual productivity. What prompted the formation of the coalition and the eagerness of so many to participate is the growing optimism that this year Congress will pass the High Performance Computing Act of 1990, which was introduced into the Senate by Albert Gore (D-Tenn.).

This legislation requires the National Science Foundation (NSF), in cooperation with the Department of Defense, the Department of Energy, the Department of Commerce, NASA and other agencies, to establish a National Research and Education Network (NREN) that links colleges, universities, government agencies, industry and businesses at multigigabit speeds.

Users of more than 100,000 computers on more than 1,000 campus and regional networks nationwide are already experiencing a taste of what the NREN will make possible, through their connection to the existing NSF network, which with other governmental, commercial and regional networks, form the Internet.

The path to the ultimate virtual library, however, won't be an easy one. Conventional publication comes about through a complex and interwoven system, and we have become accustomed to it. University scholars, researchers and other authors develop material for publication, motivated by incentives of promotion and tenure. The works are often published in the varied scholarly journals of professional societies, each of which has its own method of editing and distribution. In many cases, the abstracted journal articles are offered by vendors of on-line services, and in a few instances, the full text of the journal articles may be offered on-line. Not surprisingly, the formats of these materials, as well as the languages to perform computer searches, differ from one information provider to the next. But the primary distribution medium is print on paper.



Richard McGuire

The Coalition for Networked Information has a formidable challenge to bring about changes in the current system to make the network the medium for creating the virtual library. These obstacles range from institution practices to public policy formulation, from standards development to the creation of new economic models and fee structures.

It is significant that the coalition brings together two communities that only recently have begun to recognize a set of common interests: IS managers and librarians. We have come to recognize that managing IS transcends computing and communications technology and is more appropriately the management of the information resource itself. Some colleges and universities are modifying their organizational structures to capitalize on the synergies and converging interests of these two communities.

This alliance, with roots in the higher education community, is only the beginning, however. Business and industry have everything to gain from the existence of NREN and its virtual library. With the potential to link business and industry to the network, the results of scholarly research and publication can be communicated immediately to those most likely to apply it to technological innovation.

The NREN is viewed by its supporters as a direct action the U.S. can take to enhance competitiveness internationally. Science Adviser Allan Bromley has indicated that development of the NREN is currently one of the top four science priorities in the U.S.

Bromley said: "A future national high-speed computer network could have the kind of catalytic effect on our society, industries and universities that the telephone system has had during the twentieth century."

In taking the first step toward a virtual library, our small community of college and university IS managers and librarians need to help make this vision a reality. We must bring to the table the publishers who have a significant stake in the publication process, and we must obtain the support and participation of business and industry, which will be vital links in the process of converting research results to intellectual and technological productivity.

Ryland is president of Cause, the association for the management of information technology in colleges and universities.

Innovators should make a strong case for patents

STEPHEN Y. CHOW

In the press, the warnings have been sounded: The increase in patenting computer software is stifling innovation. But now comes a new twist on the same theme — copyright laws. On June 28, the Federal District Court in Boston handed down a decision in the Lotus-Paperback Software dispute that may pose, through copyrights, a much more palpable threat to software innovation. Immediately following the decision, Lotus filed additional suits against competitors who expressly emulate aspects of Lotus' 1-2-3 spreadsheet.

The reward of property rights is an important incentive for innovation. However, the Lotus decision and others that may follow it place in sharp focus the competing concerns. Should the incentive granted for the development of an extremely popular user interface include the right to bar from the marketplace other innovative computer programs that were independently developed but which use the same extremely popular user interface?

The answer to this question should be based on consideration of all the available incentives, not just copyrights. I submit that the U.S. patent system, as applied to computer software, provides more safeguards for a subsequent innovator than the U.S. copyright system. Simply put, patents are a better incentive for promoting and protecting innovation than copyrights.

A U.S. patent may be obtained only after substantial examination by the U.S. Patent and Trademark Office for "novelty and nonobviousness in light of existing technology" and grants certain exclusive rights for 17 years. In contrast, a U.S. copyright exists automatically upon being recorded in some medium, including magnetic media such as software. This happens without examination by any government agency and continues (in the case of most computer software) for at least 75 years.

Even at the time of enforcement, copyrighted works are scrutinized only for minimal originality — not the novelty and nonobviousness of patented inventions. Because most software copyright owners keep source code versions of their software secret, there really is no scrutiny at all of the innovation in that package. In contrast, a patent is granted *only* in exchange for disclosing to the public what is determined by the patent office to be truly "new." This promotes subsequent innovation.

It is true that patent rights — exclusive rights for making, using or selling the invention as claimed — are more extensive than copyrights, which protect only against the actual copying of a work. However, court decisions such as the recent one in the Lotus case, may allow the achievement of patent-like exclusivity through copyrights by expanding what constitutes a copyrightable work.

In the Lotus decision, a portion of the popular 1-2-3 spreadsheet was found copyrightable and infringed upon. The infringed portion consisted of two parts: the sequence of keystrokes to initiate certain functions of the program package and the screen display. Because screen displays for spreadsheet programs are obviously — if not necessarily — similar, the focus was on the input sequence.

Copyright law expressly does not apply to processes, while patent law does. The court in the Lotus case did not consider the U.S. patent law, which does apply to "new and useful processes" even though what was protected in the decision could be likened to a process.

Lone spreadsheet

If Lotus ultimately prevails on appeal and in its new lawsuits, it will have established the right to exclude any use of its extremely popular user interface for 75 years. This would happen despite the fact that the development of the interface came in part from its less successful forerunner, Visicalc. No examination of whether 1-2-3's user interface was truly innovative would have been made. The only test of whether Lotus was truly innovative was that it was successful in the marketplace. If Paperback Software had been allowed to continue, it would have potentially proven itself there as well.

Meanwhile, as the European Community approaches its 1992 target for the creation of a "single market," there is a significant effort to exclude copyright protection for software interfaces in the interest of promoting development of compatible software. Also, multilateral trade-driven negotiations among industrialized and developing countries are proceeding toward the international harmonization of patent laws.

It is too simple to say that patents are bad for software innovation and copyrights are good: Promoters of innovation, lawmakers and the public should be aware not only of the differences between our patent and copyright laws, but of how they actually promote innovation in the context of a globalized economy.

Chow, a partner in the law firm of Nutter, McClennen & Fish, is a patent and copyright lawyer, representing emerging and international technology firms.

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COMMENTARY

Rosemary Hamilton

Definitely a maybe

Do you want to hear lots of different theories? Ask someone how IBM will introduce what is commonly called Summit, its next-generation mainframe, later this year.

Whew. How about the opinion that it will come with a separate processor for expanded storage? No, make that a separate processor to handle those new, spiffy fiber-optic channels. Wait, that's not right. The separate processor will provide a data encryption/decryption function. But hold on — will this come with the real Summit or the mini-Summit? Yes. Absolutely not. Or, better yet, there is no mini-Summit.

The next-generation mainframe, like many expected products before it, is the source of plenty of gossip and rumor these days. IBM, for its part, is being characteristically mum on the subject. At a large systems briefing last week, IBM executives sketched out plans for future mainframes but would not specifically address the next generation.

Recent conversations with users and analysts produced all sorts of Summit scenarios, but they can be boiled down to a few. Even so, this is not the final word on Summit. Some observers suggested that IBM is still fine-tuning its plans for the next-generation mainframe, so at this point, the best we can do is examine the current thinking and look at what the possible op-

Continued on page 31

Firms move into the OOP lane

ANALYSIS

BY JEAN S. BOZMAN
CW STAFF

What's under the hood of your software application sports car? If it runs well, gets good mileage and needs little maintenance, it could well be object-oriented programming (OOP) technology.

Even though most end users do not realize it, many software vendors are already embracing OOP languages and database structures. However, most users, one step removed from the underlying code, still feel that OOP is in its infancy and do not plan on buying actual OOP packages until the mid-1990s.

Among vendors, the early adopters of OOP are using it to build icon-oriented graphical user interfaces or "hot-linked" applications that pass data back and forth. They include Hewlett-Packard Co., Apple Computer, Inc. and Microsoft Corp.

A forward guard of end users is already trying out the OOP sports coupe, including some at Citibank, Deere & Co., Combustion Engineering and General Motors Corp.'s EDS division, said Les Hellenack, director of new software technologies at International Data Corp. in Framingham, Mass.

One early user is Tom Soon, a research scientist at Pacific Bell's technology laboratories in San Ramon, Calif., who is using OOP to simulate the telephone networks of the 21st century. He works with the Parc Place Systems Smalltalk 80 programming language and the Servio Logic object-oriented database management system.

"The work I do involves data with very complex relationships," Soon explained. "I cannot force it into the table spaces that are used in relational databases. The object-oriented programming environment allows me to reuse the code I've created, and I can also use it to provide a super-friendly user interface [in the form of icons]."

Most corporate end users, however, remain mystified by the object-oriented technology and may turn to systems integrators to learn how to use it. That is because OOP languages require mastery of new programming skills. Object-oriented DBMSs also require users to learn new data types and storage/access methods.

"Most companies tend to stick with technologies they understand unless they've run up against a wall, because they can't accomplish what they want with the money they've got on hand," said Reed Phillips, president of Cary, N.C.-based Knowledge Systems Corp., which writes object-oriented applications for Fortune 500 companies. "They just want to get their application built, and they don't care that we're using OOP to do it."

OOP has many features to recommend it, including the way that sections of code can be reused from one application to another. Development time is shortened, and maintenance is simplified. In a process called encapsulation, the rules about sharing data are wrapped around the data itself, so the rules also become part of the object.

To some extent, object-oriented code maintains itself, because the emphasis is on up-front design and analysis rather than on implementation and repairs.

Early users in IS departments often have to develop their own OOP expertise, boning up on OOP techniques. Many have struggled to learn OOP languages, but the initial investment of time — however painful — can pay off by allowing users to create new applications.

Continued on page 31

FEATURE: 9370 UPDATE

IBM's misunderstood midrange

BY MARYFRAN JOHNSON
CW STAFF

Some computers get no respect.

That has certainly been the life story of the IBM 9370 midrange family — the stigmatized sibling of the popular Application System/400 and the staid 4381 lines.

Yet there seems to be universal agreement among users and industry analysts that the 9370 is basically a sound machine saddled with poor planning, misdirected marketing and inept public relations.

A few major sales — most notably to Sears, Roebuck and Co., Shell Oil Co., the U.S. Army and the U.S. Postal Service — have given the 9370 at least a touch of corporate respectability. And the machine has made a credible showing in revenue, adding $2 billion per year to IBM's coffers.

IBM will display its own brand of faith in the line with new high-end models and a major upgrade in performance this fall. Analysts are expecting two or three high-end 9370 models to be introduced, doubling or tripling the performance of the top-end Model 90.

"That gives me a warm, fuzzy feeling that our investment will be good for several more years," says Harvey Borden, director of MIS at Lerner Shoes, Inc. in Salisbury, N.C. His 9370 Model 90 is the primary processor for inventory control, financials and other business tasks at the fast-growing shoe store chain.

John & Wendy

Borden is in the midst of rolling out IBM 4684 point-of-sale terminals to a string of stores in the Northeast and South. Two IBM Personal System/2s will poll the stores each night to gather sales and inventory informa-

Continued on page 28

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LEGENT

N.C. agencies eye independence

ON SITE

BY SALLY CUSACK
CW STAFF

RALEIGH, N.C. — The North Carolina Department of Crime Control and Public Safety is shifting its software development strategy into high gear, embarking on a five-year plan to develop a number of products in-house and evaluate numerous third-party offerings.

"We're posturing ourselves for achieving platform independence," said Ed Bottum, director of information systems, adding that the goal is to arrive at that point with "minimal pain."

Bottum *steps up in-house development*

He has found that it may be easier said than done. Currently, the Crime Control and Public Safety Department relies heavily on Data General Corp.'s AOS/VS-based MV hardware for office automation, word processing, data collection and reporting.

The department maintains and updates numerous records for its various divisions. Its computers have a wide range of applications, including tracking parolees assigned to community service and reporting tornado watch activity.

The department operates nine divisions, five of which are automated. Four of the automated divisions use DG systems; the fifth, the State Highway Patrol, relies primarily on an IBM 3090-300 mainframe running MVS.

"We're young in terms of applications. There's a lot of creative work to be done and a lot of variety available," Bottum said. He indicated that his staff will do as much in-house development as is deemed practical and that some development will be contracted out to third parties based on available funds. There is currently a DG MV/20000 responsible for the department's headquarters operations, an MV/15000 for the Emergency Management Division, an MV/2000 for maintaining the Governor's Crime Commission and three MV/1400s in the Division of Alcohol Law Enforcement. All the systems are linked via Zodiac, an X.25 communications product.

The state agency is in the early stages of trying to determine how best to help the field offices by providing the necessary tools. For example, Bottum said, some undercover agents still use notebooks, gathering statistics manually and reporting information back to the home office division.

"We're trying to move data collection out to where the action really is," he said. "We have a lot of end users with a car for an office." Future plans include using local-area networks in the Emergency Management Division and a microwave system for state police investigations.

Emergency Management is responsible for tracking emergencies in progress, such as tornado touchdowns or nuclear cloud movements. The state uses geographic, icon-based software systems to record such sightings and report them back to a centralized Emergency Information System.

Data collecting and reporting is currently handled by various departments via more than 250 terminals connected to the DG computers, along with a mix of Data General/Ones and Intel Corp. 80286- and 80386-based IBM Personal Computer clones. The majority of end users connected to the system also use it in an office automation capacity.

Approximately 75% of the North Carolina state agencies use DG machines for office automation activities, according to Bottum. His department has been using DG's Comprehensive Electronic Office for the past four years. Prior to that, "they used typewriters," Bottum said with a laugh. "Electronic mail and word processing were the first applications used around here."

Bottum said office personnel are especially pleased with the program's calendaring functions, which reportedly have streamlined scheduling activities and eliminated countless hours of telephone tag. Although Bottum said he believes that the hardware and software are "good, solid products," he noted that he doesn't perceive DG as making a substantial commitment to the future of CEO.

Bottum said the department will maintain its DG hardware investment for "as long as it makes sense to do so." However, he added, "we don't foresee using any other software that would lock us into DG's environment."

DG unveils speedier Unix-based system

BY SALLY CUSACK
CW STAFF

WESTBORO, Mass. — Data General Corp. recently unveiled DG/UX 4.30, a faster release of its Unix-based operating system that reportedly offers a 370% speed improvement over its predecessor.

According to the firm, Neal Nelson & Associates' Business Benchmark testing on an Aviion 6220 system indicated that the latest release reduced test time from 171 sec. on Version 4.20 to 36 sec. on Version 4.30.

The revamped operating system has reportedly been certified for the Binary Compatibility Standard by the 88open Consortium, which enables customers to run and generate 88open shrink-wrapped software. DG/UX 4.30 also includes Federal Information Processing Standard 151-1 Posix compliance.

Rivalry reinforced

The upgrade reinforces DG's head-to-head rivalry with Motorola, Inc. in the Motorola 88000 CPU-based small systems marketplace, and it brings DG a little closer to competing with Sun Microsystems, Inc.'s Scalable Processor Architecture products, according to David Card, an industry analyst at International Data Corp., a Framingham, Mass.-based market research firm.

DG/UX Version 4.30 also includes support for Novell, Inc.'s Portable Netware and comes bundled with The Looking Glass Desktop Manager from Visix Software, Inc. at no charge.

The latest release is available immediately and is priced from $400 on an AV 200 platform to $2,500 on the AV 5000 and AV 6000 family of servers and multiuser systems.

Epoch targets low end with 20G-byte storage server

BY MARYFRAN JOHNSON
CW STAFF

WESTBORO, Mass. — Epoch Systems, Inc. recently added an entry-level system to its network storage servers, aiming the product at smaller workplaces that cannot afford the larger, more costly models in Epoch's Infinite Storage server line.

At $82,900, the Epoch-1 20 Series provides 20G bytes of storage — about five times the capacity of comparably priced magnetic file servers — plus fully automated storage management, company officials said. The entry-level model can be expanded to 40G bytes of storage capacity and is available three months after order.

Epoch storage servers, which can be configured with 1G byte to 1 terabyte of on-line storage, are Sun Microsystems, Inc. Network File System- (NFS) and Transmission Control Protocol/Internet Protocol-compatible servers that use hierarchical storage techniques to transparently integrate optical and magnetic disks.

The company also introduced two new software options to increase file server performance and speed up full system backups.

"These new products are a logical extension to the growth of storage on NFS networks," said Jay Bretzmann, an analyst at International Data Corp. in Framingham, Mass. "Epoch is saying they can address not only large storage problems but also management of various activities on the network."

The first software product, Hyperwrite, improves the NFS write rate using a sophisticated caching technique that allows individual files written to disk to be grouped together automatically. The product costs $3,900.

Time saver

Hypersave is a $5,000 package that uses a disk-mirroring technique to cut the time required to back up large amounts of data automatically. It can reduce a 30-hour job to back up 30G bytes of data to 1½ hours, according to company officials.

"The Epoch people have some good insights into the marketplace," Bretzmann said. "Addressing performance problems for incremental new dollars is probably the strongest sell."

The On-Line RDBMS

The Sybase View

Business critical on-line applications can dramatically affect the competitiveness of an organization. They require an on-line RDBMS architected to integrate real-time decision support and transaction processing across networked environments.

Historically, RDBMSs were designed only for decision support applications. Many vendors have tried to extend their architecture for on-line capabilities, but lack features critical to success. A true on-line RDBMS demands superior performance, integrity, availability, distributed data management, and integrated tools.

SCALABLE HIGH PERFORMANCE

For the best price performance and absolute performance, an on-line RDBMS must scale up, or down, as business needs dictate. Only an on-line RDBMS with a multi-threaded programmable server architecture has proven successful in handling peak loads, with subsecond response time, for large numbers of users, on a variety of platforms.

SERVER-ENFORCED INTEGRITY

An on-line RDBMS must enforce data security and integrity rules, including referential integrity, *in the database* rather than in each application. This requires an intelligent, programmable server architecture. This architecture dramatically reduces enterprise-wide application development and maintenance time while improving protection and data consistency.

HIGH APPLICATION AVAILABILITY

An on-line RDBMS provides high application availability to avoid costly downtime. It performs backups, recoveries, and database administration changes while applications continue to run. And it supports fault-tolerance with mirrored logs and databases, as well as multi-CPU recovery to minimize exposure to hardware problems.

OPEN DISTRIBUTED DATA MANAGEMENT

An on-line RDBMS fully supports an open client/server architecture that lets you transparently distribute applications and databases over networks of multiple heterogeneous workstations and/or computer systems. It includes a two-phase commit service to support distributed update transactions, as well as retrievals, across two or more servers. And it provides open interfaces for integrating third party tools as alternate clients and foreign data sources as alternate servers for a truly open computing solution.

ADAPTABLE WINDOWING TOOLS

An on-line RDBMS gives developers a set of window-based 4GL tools that are object-oriented, event-driven and portable. And it integrates these tools with the power of the programmable server. In addition, an on-line RDBMS gives users a set of window-based decision support tools that provide real-time access to live data with a highly intuitive graphical user interface.

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SYBASE preserves and protects your hardware and software investments while allowing your organization to grow. SYBASE gives you window-based decision support tools along with a powerful, integrated 4GL development environment; you write applications once and know that they're fully portable to a wide variety of platforms. And SYBASE provides an open client/server architecture that fulfills the promise of the on-line enterprise.

SYBASE. Architected from the outset as the on-line RDBMS.

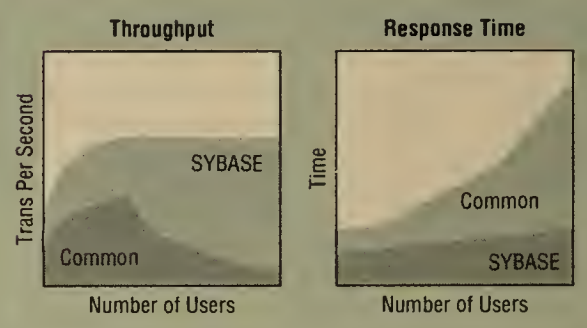
THE SYBASE FORUM

This view of The On-Line RDBMS first appeared in The Sybase Forum (Computerworld, April 2, 1990).

We'd Li Perspec The O

SYBASE SQL Server® delivers the high throughput and fast response times needed for on-line applications. Moreover, SQL Server maintains performance levels as the number of users and the size of the databases grow.

SYBASE performance is based, in part, on a multi-threaded server architecture that includes its own kernel and SQL task manager that are optimized to handle multi-user functions usually associated with the operating system. In addition, the SYBASE SQL Server architecture

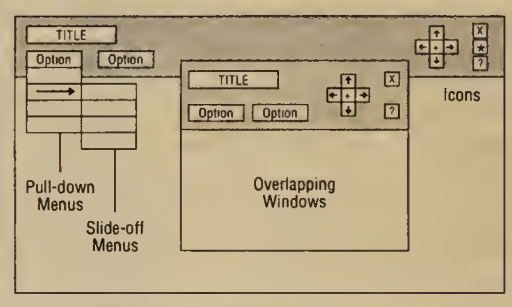


SYBASE maintains maximum transaction throughput and fast response times over an extended range of users.

The on-line enterprise cannot afford an RDBMS that must periodically be taken off-line for routine maintenance activities, such as database backups, diagnostics, design, and integrity changes.

SYBASE SQL Server allows all such activities to be handled on-line, with system-supplied stored procedures, while applications continue to run.

SQL Server also protects against hardware problems by supporting *software-based* fault tolerance with mirrored logs and databases, as well as multi-CPU recovery.



SYBASE provides a highly intuitive graphical user interface to maximize productivity for developers and end-users alike.

SYBASE boosts productivity with powerful window-based tools that meet the needs of all users. Programmers get a state-of-the-art fourth generation language (4GL) programming environment. Overlapping windows, pull-down and slide-off menus, and icons help developers build complex, on-line applications in a fraction of the time it takes using traditional tools.

In addition, SYBASE offers a complete SQL life-cycle toolset for developers. All phases are supported, including design, prototyping, development, testing, administration, and maintenance.

ke To Add Some tive To Our View Of n-Line RDBMS.

has been extended to take full advantage of symmetrical multi-processor (SMP) hardware systems. The resulting benefits are greater throughput, more effective load balancing, extended multi-user capacity, and efficient operational control.

In Computerworld (March 5, 1990, "Buyer's Scorecard") SYBASE ranked first in eight out of eighteen categories, including "Performance in processing on-line transactions" and "Performance in decision-support applications."

One of New York's most respected investment research and management companies, Sanford C. Bernstein & Co., chose SYBASE because "Of all the systems we evaluated, SYBASE was clearly the fastest. It accommodated multiple users without losing performance and offered the most functionality both on the transaction processing end and the data management end."

This is what InfoWorld (March 5, 1990, "Dueling Servers") had to say about SQL Server's referential integrity: "The more power a multiuser relational database system has, the more potential there is for disaster. If you change a number on one table, any other table that depends on it may need to be changed. The risk lies in the failure to update all the appropriate related tables. The likelihood of this increases even more as more front-end applications that access the same data are added to the system.

"SQL Server offers effective countermethods. Its triggers, a type of stored procedure that executes whenever a given condition occurs, are attached physically to a table...and check all updates, inserts, or deletions for their effect on related tables. Since the trigger is installed at the server level — and not run through the front-end application — it doesn't matter which application updates the critical table. This is a critical feature as front ends multiply, and the potential for mismanaging data is increased. And since a given trigger need only be written once, at the server, it makes data integrity programming easy."

A final note: InfoWorld rated SQL Server referential integrity "excellent."

The on-line enterprise demands data and application integration and interoperability in a multi-vendor environment — *SYBASE Open Client/Server Architecture provides exactly that.*

SYBASE Open Client permits the use of a variety of front-end tools or applications, including SYBASE applications, independent software vendor's tools, and user written applications. SYBASE Open Server can seamlessly integrate hierarchical and relational DBMSs, third-party applications and real-time data feeds into SYBASE applications.

General Logistics International (GLI) is using SYBASE to help manage and distribute the volumes of data generated daily by one of the largest and busiest container carriers in the shipping industry — Mitsui/O.S.K. Lines North America. "The ability to distribute data among various locations combined with flawless data integrity when distributing that data was key to choosing SYBASE."

In the real, multi-vendor world, SYBASE preserves your prior investment in both hardware and software. SQL Server supports portability to a wide range of computing platforms, including VAX/VMS, UNIX, and OS/2, with PC and MAC connectivity, making it a natural for linking applications residing on different machines.

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Database keeps the Earth's inventory

ON SITE

BY GARY H. ANTHES
CW STAFF

ARLINGTON, Va. — The head of the Nature Conservancy's Science Division flashes pictures of rare plants and animals onto a wall of his office, pausing at one of a drab shrub tightly encircled by a fence. "That's the only Pitkin Marsh Paint Brush left on Earth," he says. "The only one."

"That's a depressing thought," someone replies.

"It's worse than that," snaps Robert E. Jenkins Jr. "The plant's a male."

It may be too late for the Nature Conservancy to do anything for the Pitkin Marsh Paint Brush, but aided by an internationally distributed database containing the largest inventory of plants and animals in the world, the Conservancy is quietly and systematically saving endangered species by buying the land on which they live.

The database is the starting point for deciding how the Conservancy will allocate its $100 million-plus annual budget, allowing it to set priorities among thousands of potential land purchases. In the past 40 years, the Conservancy has bought or acquired through gifts some 5 million acres and has built assets worth $619 million.

The database is part of the Conservancy's Biological and Conservation Data System, distributed across 75 data centers in the U.S., Canada, the Caribbean and Latin America.

The database is actually a collection of some 45 integrated files encompassing 2,000 data fields. The key unit of information is an "element occurrence" — one of 65,000 plant or animal species or ecosystems at one of 400,000 locations. Some occurrences are incredibly detailed, with individual plants pinpointed on the globe to within 100 feet. Species and ecosystems are ranked according to their relative endangerment, both regionally and globally.

Each state or region keeps a detailed slice of the database applicable to its area, periodically mailing updates to a database at Conservancy headquarters in Arlington. Twice a year, headquarters sends out a new software release to the data centers.

John Gaman

The Nature Conservancy *tracks species such as the Green Larkspur*

The database is an important tool for setting land acquisition priorities. It produces scorecards, one for each state or region, showing conservation priorities in descending order of endangerment. "The scorecard has become a driving force in nature conservancy in the U.S.," Jenkins said.

Not long ago, a scorecard showed that an area in the state of Washington contained two endangered plants and one threatened animal — the extremely rare Oregon Checkermallow, the Green Larkspur and the Larch Mountain Salamander. The Washington area consists of several privately owned parcels and one piece in a national forest. "We're going after them one by one," Jenkins said. "The Green Larkspur is ugly as dirt, but maybe it will cure cancer."

The system began as a centralized mainframe application in 1974. Conservancy officials soon realized the data had to be closer to its source, so each state's offices brought up the application on local Hewlett-Packard Co. HP-3000 minicomputers running an HP proprietary database management system. In the mid-1980s, the remote offices cut over to personal computers running Ashton-Tate Corp.'s Dbase III, and they are now migrating to Revelation Technologies, Inc.'s Advanced Revelation DBMS. Meanwhile, headquarters is converting from its own HP3000 system to Advanced Revelation on a Banyan Systems, Inc. local-area network that includes Banyan and AST Research, Inc. servers.

Advanced Revelation is "the most capable DBMS I've ever seen," said Keith M. Carr, director of conservation systems and programming. It is exceptionally flexible, allowing variable length fields and records, multivalue fields and easy interfaces to other systems, he said.

According to Jenkins, the Conservancy has avoided pitfalls that doomed other ecological databases. Some had unclear objectives, trying to tie together too many things such as biology, scenery, recreational values and exploitable resources. Others failed because they focused on the short term or on sites rather than on plant and animal species, making analyses of species across different areas difficult.

9370

FROM PAGE 23

tion, feeding that data into the 9370 for processing. Eventually, the store clerks will sign in on the terminals rather than submitting time cards, eliminating one more paper-generating task.

"The machine has given us very few problems," Borden says, adding that he is awaiting IBM's fall announcements with particular interest in improvements to the VSE operating system.

The new VSE/ESA will provide better overall performance, improve memory management and block paging and make more effective use of expanded storage, says Susan Gannon, an analyst at Technology Investment Strategies Corp. in Framingham, Mass.

No new customers

"I think the fall announcements may cause people to take a second look at the 9370," Gannon adds, "but it's not likely to renew its life or make major inroads with customers who are not already in the 370 world."

Borden views the anticipated changes in VSE as his shot at getting "a miniature MVS — all the advantages of MVS on my VSE. That's another reason why the 9370 has turned out to be a good box."

Overall, the 9370 family seems to be enjoying some successes where IBM did not anticipate them, says George Weiss, director of midrange systems at Gartner Group, Inc. in Stamford, Conn. "Because of the 9370's complexities of installation and its user interface, it was just not a manageable system at the end-user level in departmental applications," Weiss notes. "But it's obvious that IBM has not given up on it."

After having spent several years figuring out whether the 9370 was a departmental machine or a 370 extension, IBM seems to have found a place for the midrange computer. The company has identified communications and application-specific computing as viable areas for the 9370 and also pitches the system as a replacement for outdated, low-end 4300s. It sees the 9370 as a platform for an assortment of niche operating systems such as MUMPS, Pick or DPPX, the operating system for the discontinued 8100 line.

"I think that by positioning it as a niche machine for specialized applications, IBM has been much more successful with it," says Karen Landis, an analyst at Computer Intelligence in La Jolla, Calif. "We saw some definite pick-ups in 9370 business in the last year or so."

Market researchers from International Data Corp. and Computer Intelligence estimate that IBM has sold about 7,000 of the machines since its debut in 1986. Yet when compared with the 67,000 AS/400s sold in just two years, the 9370 may look downright pitiful.

"It's a very niche role machine — a couple here, a couple there," says John McCarthy, an analyst at Forrester Research, Inc. in Cambridge, Mass.

However, comparisons with the AS/400 are not necessarily fair ones. The AS/400 is a minicomputer, whereas the 9370 is considered a small mainframe. Furthermore, AS/400 sales have essentially been upgrades from existing System/36 customers. The 9370 had no such ready-made customer base.

If anything, the 9370 has helped out the AS/400. While it seems a cruel joke now that the 9370 was once dubbed the "VAX killer," McCarthy points out that the 9370's arrival did slow Digital Equipment Corp. down "enough to allow IBM to close in with the AS/400."

"IBM's problem with the 9370 was that it raised the bar too high to begin with," says Robert Djurdjevic, president of Annex Research in Phoenix. "Then as the product began shipping, it was apparent it lacked many parts of the application software, so it got very bad press."

Bad is good

Some users leveraged those well-publicized difficulties to their own bargaining advantage, however.

"I think all the bad press did users a favor. It lowered the price," declares Michael Frodyma, vice-president of MIS at Richard Leahy Corp. in Silver Spring, Md. "We're very happy with the 9370 and have no plans to leave it. We think it's a treat."

The direct-response insurance marketer, a subsidiary of Lincoln National Corp., turned to the 9370 to help control escalating costs at its computer service bureau three years ago. Within six months after installing the 9370 Model 60, the business broke even on its in-house computing costs.

"We like the traditional System/370 tools," Frodyma explains. "We're running a shop with seven people, and we're able to support a $15 million company with a million and a half records on-line. We do have a few applications that don't have the response time we're looking for, but that's more of a tuning issue."

> "I THINK all the bad press did users a favor. It lowered the price."
>
> MICHAEL FRODYMA
> RICHARD LEAHY CORP.

Frodyma says the effectiveness of the 9370 in managing his business enabled him to cut back on the proliferation of personal computers at the firm. "We are kind of unusual in that we wanted to cut back on PC growth, and for the most part we've succeeded in controlling it to production systems," he says. "We have a Novell [local-area network] running and a few claims systems on the PCs, but for word processing we run [Wordperfect Corp.'s] Wordperfect on the 9370 with dumb terminal access."

In Knoxville, Tenn., Albers Healthcare Systems recently replaced its aging 4361 with a 9370 Model 90 to handle all the processing tasks for the $140 million firm. John O'Hara, vice-president of information systems at Albers, uses the system for all processing needs, from customer orders and financial applications to handling communications with distribution centers in Tennessee and West Virginia.

At Bozzutos, Inc., a food wholesaler based in Cheshire, Conn., MIS Director Donald Zagar is preparing to renew his lease on the 9377 Model 90 that runs in-house applications for inventory control.

Although system use has expanded from 10 to 80 users over the past three years, Zagar says he still has enough capacity left to stick with his current machine rather than upgrading to the new, more powerful models coming this fall.

"We are also looking more closely at PCs now," he adds. "We are thinking about moving some applications off to distribute the processing."

The 9370 may continue to gain respect as the new high-end models make their appearance this fall. They are considered to be a natural stepping-stone from the 4391 — the next generation of the 4381 line.

Some analysts speculate that IBM will unveil some sort of hybrid machine that serves to combine the two product lines, "but I just hope they don't give it the 9370 nomenclature," Landis says. "It's had such a bad reputation, I have a feeling a lot of users would be hesitant to take up a 9370."

Oddly enough, one of the 9370's image problems seems to be lack of any particular strong or weak point, Landis notes. "It's just a little workhorse that runs the same software as the big guys."

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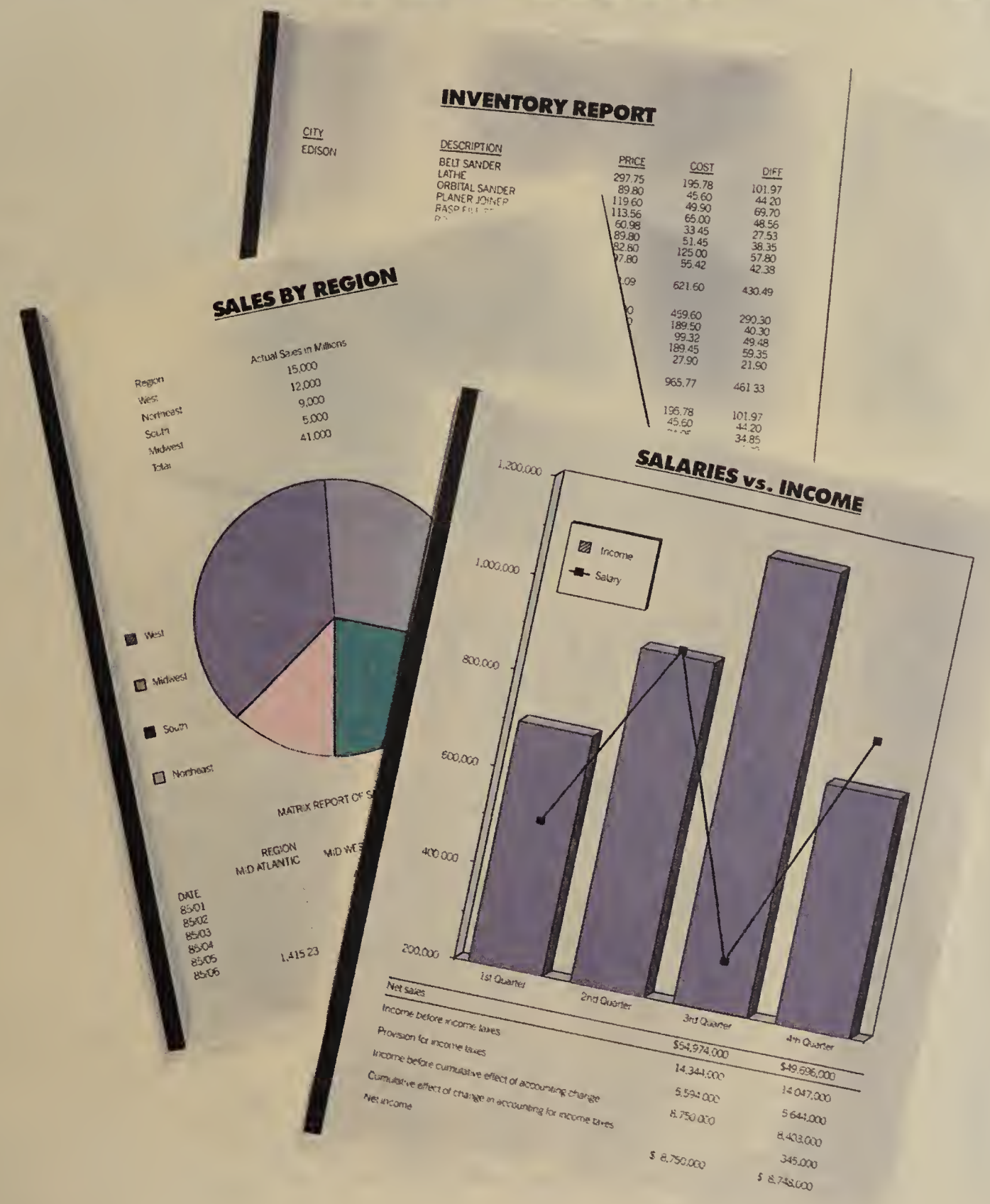

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Speed upgrade option	✓ up to 10 ppm	No
Adobe PostScript option	Yes	Yes
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Std. plotter emulation	✓ Yes	No
Font card slots	✓ 2	1
Std. input paper tray capacity	✓ 200	50
Std. output paper tray capacity	✓ 100	50
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*Dealer prices will vary.

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Hamilton

CONTINUED FROM PAGE 23

tions for users are.

Let's start with the simplest option. It seems that many people are still expecting a huge IBM Enterprise System announcement early this fall.

IBM is expected to provide new models for all of its System/370 lines, analysts said. This includes new 9370 models at the low end, the follow-on to the 4381 and a new release of MVS/ESA.

However, it starts to get confusing when you get to the high-end mainframe component of this announcement. Some expect this portion to include three pieces. Others think it will be only two.

In the first case, IBM would introduce functional enhancements to existing 3090 J models and an initial Summit system — the so-called mini-Summit — as well as announce the real Summit for delivery in the second half of 1991.

In the second scenario, IBM would introduce the 3090 J improvements and announce Summit. There would be no in-between system, and the idea would be to get at least a few Summits out to early support sites by year's end and follow up with general availability next year.

Sorry, but I don't know which scenario is right. One information systems director, who said he was briefed by IBM, is counting on a mainframe announcement this fall that will include the mini-Summit. That system would include a new frame, power supplies and all the other environmentals but have the same 3090 J innards.

However, Frank Gens, a vice-president at Technology Investment Strategies Corp., said he thinks IBM will skip the mini-Summit and stick with a straight Summit announcement. He said he believes too many customers would say, "What's the point?" to an in-between system and not buy it.

If it does come down to these two scenarios, it seems that they both have the same bottom line. The Summit performance boost, which will supposedly take the uniprocessor performance up into the 40 million instructions per second range, will not be available to most customers until later next year.

THE NEXT-GENERATION mainframe, like many expected products before it, is the source of plenty of gossip and rumor these days.

In a sense, "customers are stuck," Gens said. If the real Summit isn't available until the second half of 1991, customers will have to wait because the alternatives from competitors will not be available until that time frame, either.

What it comes down to, then, is how many Summit-like features users want or need in the meantime.

A mini-Summit would have advantages for some users. By providing all of the Summit externals, a user could then do a CPU swapout to upgrade to the real Summit later on. Furthermore, it is expected to come with some of the newer mainframe functionality, such as fiber-optic channels. Although users won't have the raw performance boost, they will at least have some new features.

Still other users may see no reason to phase in Summit that way. Those fiber-optic channels, for instance, are one of the expected functional improvements for existing 3090 Js, anyway.

Hamilton is *Computerworld's* senior editor, systems and software.

OOP

CONTINUED FROM PAGE 23

"We've developed an automatic programming system that turns [computer-aided design and manufacturing] designs into instructions for our board-fabrication machines," said Daniel Rasmus, manager of computer-assisted manufacturing at Western Digital Corp. in Irvine, Calif. Rasmus uses Nexpert Object, an object-oriented programming package from Neuron Data, Inc. in Palo Alto, Calif., to place object-oriented rules into ordinary C programs.

However, the steep learning curve still puts off many potential users. "One of the real problems is that the right language for the users doesn't really exist," Hellenack explained. "What you're seeing is a staging of the OOP technology. There are object-oriented programming languages and object-oriented databases, but the analysis and design tools aren't there yet."

However, Hellenack said he believes that the OOP revolution is not far off. Driven by a need to reduce development costs — and allow users to write their own applications — IS departments should be shopping for OOP products by the time 1992 rolls around, he said.

One systems integrator that works with Wall Street and the federal government sees a need for a go-between right now. "All we've done is to provide users with customized object editors," said Dan Stickle, director of decision support products at Delfin Systems, Inc., a federal contractor in Sunnyvale, Calif.

The benefits are there, he said, adding, "Users will find that manipulating objects is a far easier way to understand complex problems than using conventional application programs."

NEW PRODUCTS — HARDWARE

Turnkey systems

Opus Systems has announced the Personal Mainframe/8000-33, a turnkey Unix workstation and multiuser system, and the Series 428 Personal Mainframe, a Unix workstation and multiuser subsystem.

Both models reportedly run at 44 million instructions per second and are based on Motorola, Inc.'s 33-MHz 88000 reduced instruction set computing microprocessor.

List prices are $21,495 for the Personal Mainframe/8000-33 and $13,557 for the Series 428 Personal Mainframe.

Opus Systems
Building 400
20863 Stevens Creek
Cupertino, Calif. 95014
(408) 446-2110

Stratasys, Inc. has announced a system that constructs plastic objects from three-dimensional wire frame, surface or solid computer-aided design (CAD) models.

3D-Modeler accepts 3-D data from CAD systems that support industry-standard Initial Graphics Exchange Specification format. It also displays real-time object slicing on Unix platforms running at 16 million instructions per second, according to the vendor.

The product is offered as a stand-alone unit for $130,000 or as a turnkey system with a Silicon Graphics, Inc. workstation and Stratasys' Strataslice software package for $178,000.

Stratasys
7411 Washington Ave. South
Minneapolis, Minn. 55439
(612) 941-5607

I/O devices

TDC has unveiled Docuscan Plus, a document capture subsystem developed specifically for users of IBM Imageplus who need to convert large volumes of data into digital images.

The product was designed to meet the demand for two-sided document capture capability for transaction processing on Imageplus. Options include a 200 dot/in. image display monitor for viewing images while scanning, a 220 char./sec. ink-jet endorser and a 1,500-page automatic document feeder.

System requirements include a Personal System/2 Model 80 server and a companion Imageplus software package from IBM.

TDC
5510 Cherokee Ave.
Alexandria, Va. 22312
(703) 750-3717

TDC's Docuscan Plus *meets two-sided document capture capability*

Cognex Corp. has introduced a machine vision system that enables manufacturing engineers without programming or machine vision experience to solve on-line gauging, robotic guidance, part inspection and part tracking problems.

On-Sight provides users with an interface that displays video images of an object on a color monitor. A palette of icons that represent various vision system capabilities is also displayed.

The system is housed in an Apple Computer, Inc. Macintosh II system. Single-quantity pricing starts at $25,000.

Cognex
15 Crawford St.
Needham, Mass. 02194
(617) 449-6030

Ideal Technologies has introduced a Texas Instruments, Inc. 8920 Forms Printer that is compatible with Digital Equipment Corp. systems.

The 8920 is a wide-carriage forms printer that features zero forms waste and a printing speed of 600 char./sec.

The product sells for $2,495.

Ideal
13101 Washington Blvd.
Los Angeles, Calif. 90066
(213) 827-9023

Power supplies

A fourth generation of uninterruptible power supplies (UPS) has been announced by Best Power Technology, Inc.

The company's Ferrups and Micro-Ferrups line of UPS now features artificial intelligence, the ability to test inverters and batteries, automatic smoothing of odd-order harmonics, a smaller footprint and 92% efficiency.

The products range in capacity from 500 VA to 18 KVA and cost between $895 (500-VA models) and $12,745 (18-KVA models). All prices include batteries.

Best Power Technology
P.O. Box 280
Necedah, Wisc. 54646
(800) 356-5794

Taesung Industries, Inc. has announced four uninterruptible power supplies (UPS) featuring a proprietary advanced standby technology that enables the UPS systems to switch from AC to backup power in less than 1 msec.

The UPS-3000 and 4000 were designed to support stand-alone personal computers and workstations. The UPS-5500 and 7200 were designed for network file servers and large workstations.

Pricing ranges from $299 to $619.

Taesung
2001 Westside Pkwy.
Alpharetta, Ga. 30201
(404) 664-8944

NEW PRODUCTS — SOFTWARE

Database management systems

Micro Trac Systems has released Version 4.0 of its Restrac employment management database system.

The product is being offered with the Restrac Professional applicant tracking system and includes an upgrade to the Restrac Resume Reader, an intelligent on-line resume scanning and retrieval package. It runs on Intel Corp. 80286- and 80386-based systems and supports Token-Ring and Ethernet local-area networks.

Pricing starts at $4,995 for a single-user installation and $6,995 for multiple-user network versions. The Resume Reader module costs $6,995.

Micro Trac Systems
19 Needham St.
Newton Highlands, Mass. 02161
(617) 965-4660

Computer-aided software engineering

Netron, Inc. has released Version 2.05 of Netron/CAP, a computer-aided software engineering system for developing and maintaining Cobol applications on Digital Equipment Corp. VAX systems.

The system includes an IBM IMS test facility for testing IMS mainframe applications built on VAX platforms and a Listing Annotator for use in debugging and impact analysis.

Pricing starts at $50,000.

Netron
99 St. Regis Crescent North
Toronto, Canada M3J 1Y9
(416) 636-8333

Utilities

Demax Software has announced a disk configuration to process striped disks.

The Squeezpack defragmenter was designed primarily for users of Digital Equipment Corp.'s VAX 9000 series machines. The product makes fragmented files contiguous to reduce the number of physical disk accesses, according to the vendor.

Pricing ranges from $245 to $3,395, depending on VAX configuration.

Demax Software
999 Baker Way
San Mateo, Calif. 94404
(415) 358-3800

Viasoft, Inc. has announced a documentation tool that understands the logic of Cobol.

Via/Smartdoc automatically generates comprehensive Cobol program documentation. It collects data directly from the program's source code, analyzes and organizes the information into detailed, accurate hard-copy documentation.

The product supports all versions of Cobol, including Cobol II, and runs in batch mode under MVS/XA, MVS/ESA or MVS/SP. It is available for $29,500.

Viasoft
3033 N. 44th St.
Phoenix, Ariz. 85018
(602) 952-0050

Applications packages

Cincom Systems, Inc. has announced Release 7.0 of Control:Manufacturing, its complete business system for manufacturing companies.

The software package includes an enhanced user interface and redeveloped screens modeled after the Common User Access standard.

A controlled release for Digital Equipment Corp. VAX/VMS platforms started last month, and general availability for IBM MVS and VSE environments has been scheduled for September.

Pricing for basic IBM configurations ranges from $125,000 to $400,000. VAX models cost between $70,000 to $260,000, depending on configuration.

Cincom
2300 Montana Ave.
Cincinnati, Ohio 45211
(513) 662-2300

Banner Software, Inc. has announced Release 2.20 of its VSM/VM software package.

Features include the ability to transfer all output at channel speed, thereby improving transaction responses for real-time print tasks; reduced storage requirements for CICS or other types of monitors because of fewer concurrent print tasks; and the ability to block data to suit a destination printing device, according to the vendor.

The software runs on VM/IS, VM/SP, VM/HPO or VM/XA-SP. Pricing starts at $9,000.

Banner Software
9719 Lincoln Village Drive
Sacramento, Calif. 95827
(916) 364-0900

PRODUCT REVIEW

Making the case for Nomad

Must Software International

This is the second in a monthly series of performance benchmarks that for the next several months will focus on the integration of computer-aided software engineering (CASE) and fourth-generation language (4GL) products. The benchmarks are monitored by an independent team headed by David Whiteside, managing director of Computing Futures Ltd. and his associate, Prof. Eberhard Rudolph, formerly of the University of Auckland, for exclusive publication in Computerworld.

Each product is observed in action over a three-day period during which a vendor team solves the case study project costing system, an application that is familiar to most information systems professionals. The team's mission is to demonstrate the capability of the major CASE/4GL environments to deliver complete and complex business solutions under "live fire" conditions. In this issue, we look at Nomad from Must Software International.

•

For this benchmark, the "team" consisted of one person, who finished the test without fail in just under 27 hours, and thus the grade "excellent" was given for level of completion. Several estimating tools suggested that the task would require at least 120 hours using advanced development environments and experienced staff.

However, some of the speed achieved comes from the fact that only one person was involved, which reduced the communication overhead that is usually observed. Also, the development in Nomad is realistically restricted to one programmer. Without concurrent development, therefore, the elapsed times are rather lengthy. For these reasons, we regarded the speed of development as "good."

•

After completion, the developer had to modify the system. During this crucial test of the tools (the developer had no prior knowledge of the nature of the change), he was able to make the necessary modifications in a very short time, working almost without any documentation. The speed of development was clearly better in the maintenance phase, more than twice that of the initial development, justifying a "very good" rating for speed of maintenance.

•

The documentation produced during the test was minimal, and it consisted solely of program listings that were short but not easy to read. There may be documentation features that were not used in the test, but what was shown was rated "poor."

•

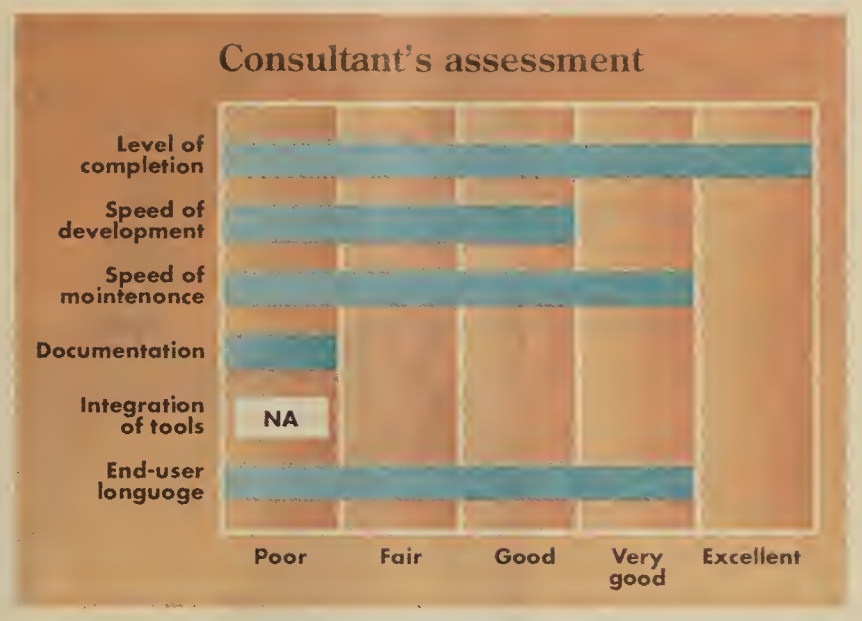
There were no tools to be integrated. Third-party CASE tools could be used up front, but their results have to be imported manually into the Nomad environment. Thus, a rating on integration of tools was not applicable in this benchmark.

•

Nomad's end-user support was strong, with a powerful inquiry and simple report generating feature that easily provided complete solutions to the case study problems. Because not much end-user guidance was provided and the end-user tool Nomad Assistant could not be used to help in one of the inquiries, end-user support was rated "very good."

•

In summary, Nomad could do the job, but it was sometimes stretched to its limit with the complexity of the benchmark. Without the experience of the developer, we may have had a less favorable result. This is an excellent information center product, but there are limitations to the size and complexity of the data processing tasks that Nomad could handle in a large development environment.



Must Software International's tool kit

- Nomad — Fourth-generation language with an integrated information center DBMS
- Nomad Assistant — end-user decision support tool

Development and maintenance report card

Performance in each area is graded from A (excellent) to F (poor).

ANALYSIS AND DESIGN: NA
In the absence of an integrated CASE tool, the Nomad solution was derived with a minimum of analysis and design. Instead, during implementation, the specifications were entered "as is," which required several structural changes.
Strength: Not applicable (NA).
Weakness: Design derived by CASE tools has to be re-entered manually.

DATABASE SETUP: C
Although entered manually, the data structures were implemented in a short time, and they included most of the validation rules. The schema presentation and debugging facilities were not user-friendly.
Strength: Powerful defaults.
Weakness: Limited to Nomad internal, DB2 and SQL-type database management systems.

FILE MAINTENANCE TRANSACTIONS: D
This step took longer than expected because Nomad provided little support in handling transactions that referenced more than one file. In addition, without an up-front design, on-the-fly coding was cumbersome.
Strength: Single file transactions are highly automated.
Weakness: There is a lack of structure supporting multifile processing.

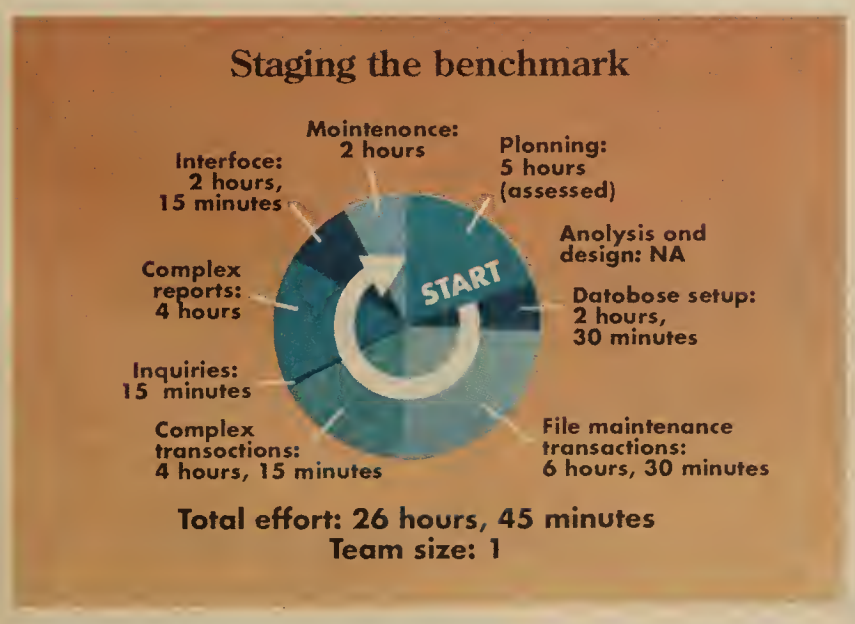
COMPLEX TRANSACTIONS: C
Getting into the more complex transactions, the limitations previously observed became even more evident. An embarrassing result could be avoided only by the experience and persistence of a top-notch developer.
Strength: A great deal of processing logic is handled at the schema level.
Weakness: Some defaults were too smart and caused serious errors.

INQUIRIES: B
The Nomad defaults were ideally suited to this type of application. A solution was developed on the fly with exceptional ease. End users, however, may find the Nomad language difficult, particularly because the end-user support tool Nomad Assistant could not do the job.
Strength: Nomad can provide a solution with a few lines of code.
Weakness: The end-user support tool could not handle the request.

COMPLEX REPORTS: B
The data structure needed modification to comply with the requirements. The program had to be rewritten several times to accommodate the staff assigned to a project.
Strength: Once the problem is well defined, an experienced Nomad programmer can provide a quick solution.
Weakness: It lacks a sophisticated report generator.

INTERFACE: A
The standard utility to input Ashton-Tate Corp. Dbase files transferred the external data with ease. After some time-format and date-conversion problems, a solution was developed in a very short time.
Strength: A Nomad schema was automatically created from Dbase files.
Weakness: There were some problems with date conversions.

ENHANCEMENT: B
The enhancement required changes to the schema, the program logic, screen and report layouts. Even without formatted documentation, the expert programmer and his knowledge of the initial solution provided a timely conclusion.
Strength: Substantial alterations were implemented fast.
Weakness: Experience with the initial code was necessary.



The solution was developed on an IBM 3038 running under VM with a link to a 4M-byte Personal System/2 Model 70. Operated in a time-sharing service, there were typically 80 to 120 active users competing for resources. The solution was derived entirely with Nomad.

Details of the products are available from: Must Software International, 4th floor, 101 Merritt 7, Norwalk, Conn. 06856. (203) 845-5000.

Development World *product briefings are based on a series of full solutions to the case study. They are prepared by leading vendors and published along with in-depth product analyses and consultants' test reports in Development World Libraries. Please see business reply card between pages 96 and 97 or FAX (508) 820-0146 for a brochure.*

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IDC WHITE PAPER

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AN IDC WHITE PAPER FOR INFORMATION SYSTEMS MANAGEMENT

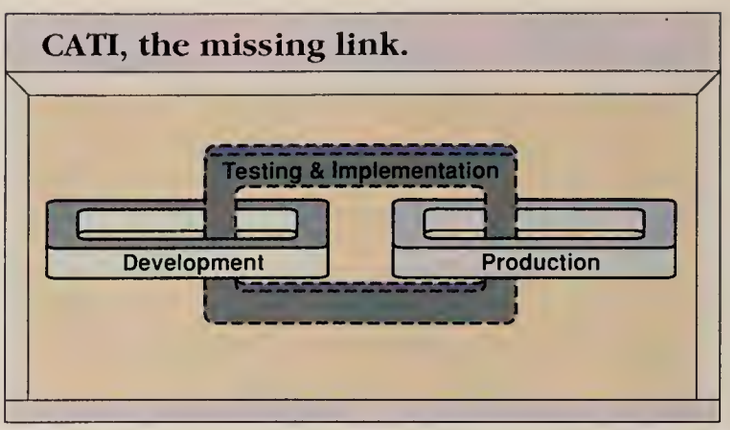
CATI

THREE RECENT AND WELL-PUBLICIZED SYSTEMS FAILURES ARE LEADING CORPORATE MANAGEMENT TO RESTRUCTURE ITS APPLICATION DEVELOPMENT PRIORITIES. THESE EXECUTIVES ARE BEGINNING TO UNDERSTAND THAT BUILDING MISSION-CRITICAL APPLICATIONS THAT WORK EFFECTIVELY AND PREDICTABLY IS AS IMPORTANT AS INCREASING PROGRAMMER PRODUCTIVITY. ■ AT&T BEGAN TO NOTICE A PROBLEM. A MAJOR PROBLEM. ITS LONG-DISTANCE NETWORK WAS OUT OF COMMISSION. HOWEVER, HEAVY TRAFFIC WASN'T THE CAUSE. THE CULPRIT WAS A MAJOR FAILURE OF ITS NEW NETWORK SOFTWARE. AT&T REQUIRED MORE THAN A DAY TO CORRECT THE PROBLEM. IT

required longer than that to put its users at ease.

American Airlines recognized that it was not filling all of its available seats. A new software system indicated planes were full when substantial numbers of unsold seats remained. Revenue went out the window, and top management raised the roof.

The Internal Revenue Service was in a taxing situation. Its new digital, income-tax submission system wasn't working, and filers who expected immediate returns weren't getting them. The image of the IRS, already bad enough, got worse.



Computer-assisted testing and implementation can unite the application development and production environments.

These highly publicized system failures and hundreds of less spectacular, less publicized examples highlight the need for more control in application development environments. Although its ability to rapidly generate code gives a predictable boost to application development, computer-aided software engineering (CASE) is not enough.

Increasingly, corporate managers are demanding computer-assisted testing and implementation (CATI) to ensure that mission-critical applications work as expected. CATI, an ally of CASE, is a set of coordinated and increasingly integrated tools used by application programmers to test and debug application software. Although less predictable in its productivity gains than CASE, CATI can be counted on to provide enhanced programs and fewer production problems in addition to detecting and correcting catastrophic system problems.

CATI TODAY

The AT&T, American Airlines and IRS examples graphically depict the importance of online applications to both current and future business success. The importance of, and growing interest in, CATI flow directly from the increasing dependence of modern corporations on online, networked applications. A company's complex application environment often includes several different database management systems, different file structures and different operating systems that may span multiple time zones and continents.

Online applications are the entry point into mission-critical business information used to make tactical and strategic decisions. The quality of these decisions necessarily reflects the application's strengths and weaknesses. This complex environment places greater demands on the testing, integration and implementation of systems prior to their migration to production.

Despite the best efforts to prevent it, these crucial online applications do have problems. They can put the temporary fate of an entire company in the hands of an unfortunate applications analyst who is charged with finding a resolution while under unbearable pressure. When placed in a situation such as this, why attempt to cope without the protection offered by CATI?

HOW MISSION-CRITICAL APPLICATIONS FAIL

Mission-critical applications may fail in three general ways. First, the application may suffer from endogenous, or internal, failure. The errors arise from internal inconsistencies that can be identified in isolation. Standard testing and debugging tools and procedures can identify these problems and facilitate correction.

Second, the application may suffer exogenous, or external, failure. Exogenous failures frequently result from interactions with concurrent applications in large network installations. They cannot be identified in isolation. Exogenous failures must be evaluated in the actual production environment or in a simulated environment that effectively mirrors the actual production environment.

Finally, complex applications may suffer from internal inconsistency. In simple terms, the information output from the system may not properly reflect information that has been entered. Complex application environments with thousands, perhaps millions, of potential interactions cannot be validated directly. Recent testing advances use statistical regression techniques to test for valid replicative results.

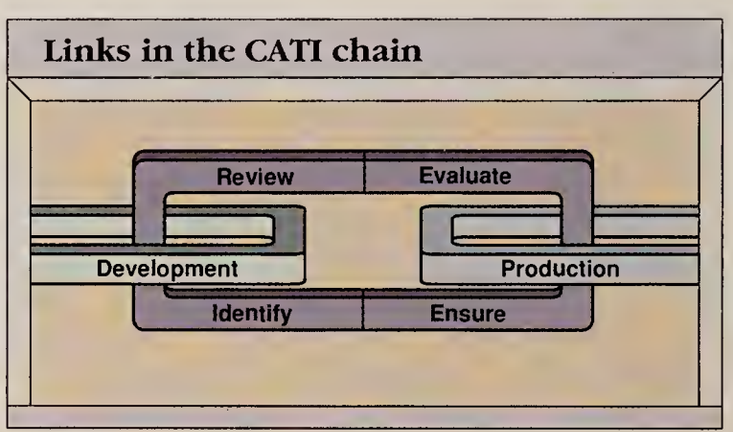
CASE has gotten a lot of attention in the wake of IBM's AD/Cycle announcement and the spate of related announcements from other vendors who want a piece of IBM's pie. Despite CASE's potential for developing new applications, however, it is often not the total answer to mission-critical application environments. IDC predicts AD/Cycle and its spin-off environments will lend themselves to CATI in the near future.

CATI – THE MISSING LINK BETWEEN CASE AND SUCCESSFUL BUSINESS RESULTS

Like CASE, CATI represents the natural evolution of well-known and widely used information systems testing and implementation tools into an integrated package. Those tools, described below, provide a wide range of capabilities.

Fault diagnostics, which rely on expert systems, or knowledge-based tools, intercept system error messages and other problems and immediately identify the nature of the problem. These tools essentially automate the time-consuming process of analyzing hexadecimal memory dumps and system error codes.

Network simulation tools do testing by replicating complex network environments. These tools help implementors who need to time-stamp processes in order to identify specific conditions that cause problems. They also help implementors stress test applications to determine the impact of imposing heavy loads on existing networks.



CATI is much stronger as an integrated entity than it is as a collection of its many individual tools.

Some companies have an identity crisis.

We have an anti-crisis identity.

And what exactly is a software crisis? It's $50 million in lost ticket revenue to a major airline. It's a candy company coming up 11,000,000 chocolate eggs short at Easter. It's a telephone company losing half of their calls for nine very long hours.

These are actual software "glitches" that have had disastrous results. In terms of dollars *and* reputation.

That's why Compuware has devoted 17 years to developing products that detect errors and incompatibilities in IS systems. Our programs provide automated testing with clear, concise diagnostics that take you right to the source of any potential problem. Before it becomes a crisis.

Finding a solution *before* there's a problem. That's Compuware.

For more information, or additional copies of the IDC White Paper, call 1-800-521-9353.

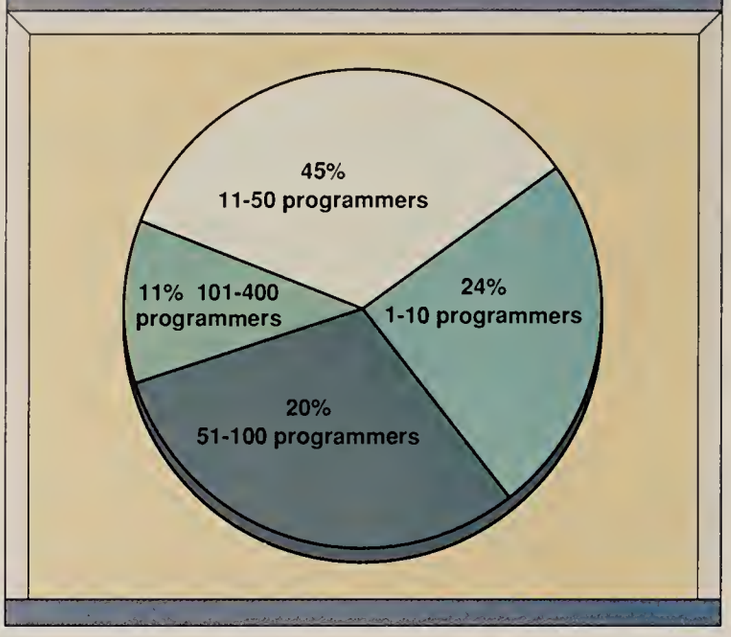
COMPUWARE

A typical network simulation tool can simulate a live, online CICS transaction processing environment. This allows programmers to do three things: test applications in environments with thousands of simulated transactions in progress, freeze specific snapshots of actual environments and modify simulated environments. Regression techniques permit evaluation of the accuracy and replicability of applications in complex environments.

Debugging tools facilitate immediate problem evaluation and resolution. They incorporate some sophisticated tools for isolating problems in complex network environments. On line editing tools permit rapid correction of application programs for both source code and data.

Without these CATI tools as a link, the benefits of CASE will not ultimately translate into bottom-line business benefits.

Numbers of programmers at 100 IDC survey sites.



Almost 70% of IDC survey sites have between one and 50 programmers, while the remaining 31% have between 51 and 400.

THE IMPORTANCE OF INTEGRATED CATI

CASE and other application development tools measure their impact in terms of months and years. Development programmers can look months ahead to identify and resolve issues. In contrast, CATI measures effectiveness in minutes and hours. Once a problem is identified, management committees need not start counting the hundreds of thousands of dollars at risk, because CATI can identify, analyze and correct the problem swiftly.

Integrated CATI is beginning to establish the next plateau in testing and implementation. Integrated CATI offers two key facilities. First, it allows programmers to move easily between individual tools without logging on and off. This is provided – without extensive education and training – through common interfaces and instruction sets. As a result, solutions from one tool can be implemented within a second tool environment, seamlessly. This significantly reduces total programmer effort. Second, an integrated CATI environment permits construction of expert systems, which draw from common knowledge bases and information generated by multiple analysis tools.

The integrated CATI environment also allows IS and quality assurance people to capture the knowledge of programmers in a consistent and replicative manner. Integrated CATI, with diagnostics and simulation tools, enforces a testing and evaluation structure that remains with the corporation as programmers move to new levels, allowing maximum utilization of key people.

Although we may wish to believe otherwise, problem analysis and correction is an art, not a science. We rely on the expertise of individual technicians who have developed techniques for dealing with a finite number of specific problems. The technicians know the process, but IS typically neglects to capture that knowledge. Why? Many IS shops are so busy responding to, and solving, everyone else's requests and problems that they do not take time to step back and look at their own needs.

Specific problem types call forth common responses – the basic condition for developing an expert system. We are already seeing this methodology being developed in data centers with their "lights out" operations that allow the data centers to operate without humans on the premises. CATI capabilities such as fault diagnostics readily lend themselves to this type of intelligent environment. Why have a human responsible for recording and retaining solutions and responses to repeating problems? With CATI, this is accomplished faster – at machine speed – and more accurately. The integrated CATI environment employs reusable techniques and routines to analyze and correct errors. What could be simpler? In the volatile world of IS, CATI is a consistent buffer against the unpredictability of online systems.

Not too long ago, the major emphasis was on reserving processor resources with "desk checking," a labor-intensive, human-error-prone process. Today's approach is much different. In the quest to optimize the application development effort, there is still much concern for processor resources, but there is also concern for balancing human involvement with machine capabilities. The movement is toward minimizing human involvement, especially in repetitious tasks, while taking advantage of faster processors.

In operation, integrated CATI steps programmers and technicians through a specific sequence of diagnostic steps and possible fixes. In this environment, the problem of not incorporating the expertise of the IS staff is resolved, as CATI works best when synthesizing input from various sources.

Adding simulation capabilities to an integrated CATI environment moves testing and correction to a higher level. Simulation permits reconstruction of the environment in which the problem occurred. Problem resolution structures can require that revised applications pass tests in this simulated environment. This strict adherence to testing gives managers back the power to control their own computing fates.

CATI AS PART OF AN INTEGRATED APPLICATION DEVELOPMENT ENVIRONMENT

As integrated CATI moves upstream in the application development cycle, knowledge of specific problem areas and typical problem conditions will be built into the application development process. This procedure can happen in two ways.

First, new application development efforts can incorporate the knowledge contained in the integrated system. Development programs may be tested in simulated environments to ensure compatibility with existing application portfolios. IDC expects this will become increasingly seamless as application development tools become more sophisticated during the next 10 years.

Second, the knowledge can be incorporated directly into the application development engine. IDC believes this scenario, which is highly attractive to end users, will also occur within the next 10 years.

In either situation, integrated CATI represents a significant new plateau in the drive to automate software development. Leading-edge application development managers will increasingly use integrated CATI to amass application testing knowledge and remain at the forefront of application development practices. This leadership position will put them in a place to implement their systems with confidence, while possibly saving their companies millions of dollars.

CATI AND CORPORATE MANAGEMENT

IS enjoys a unique position in most organizations. Information systems increasingly represent mission-critical applications that help determine corporate viability. Few operating units with similar influence over corporate fortunes could consider moving directly from specification and development to operational status without a formal testing and evaluation process. The IS mystique, coupled with sometimes overwhelming application development backlogs, frequently leads IS to short cut their testing and evaluation procedures.

Despite knowledge of the aforementioned worst-case scenarios that struck AT&T, American Airlines and the IRS, corporate managers frequently overlook the comparative economics of CATI and CASE. CASE offers clear operational efficiencies, while CATI reduces the possibility of major loss and increases programmer productivity.

IDC's Software Research Group regularly monitors and forecasts IS application development plans. As part of its ongoing research, a group of 100 large IBM IS managers was recently surveyed. IDC discussed the users' application development environments and their plans and expectations for application development installations. Their responses, in combination with additional IDC user information, can be used to construct a typical IBM mainframe development installation.

Application development staffs at IDC survey sites range from 10 to 400 programmers, with an average of about 50. The average site programming budget is about $3 million. Using typical budget ratios, it is reasonable to estimate that the data processing budget at this average site will be in the $12 million range. This budget represents typical expenditures for a corporation with total revenue of approximately $500 million.

CASE users and vendors offer a broad range of estimates for sustainable productivity increases associated with CASE implementation. IDC estimates that new application development at large mainframe sites currently represents about 40% of total programmer effort. Total programmer expenditures for new application development would be about $1.2 million at our typical site. The site will probably find that new application development productivity increases by 25% after CASE implementation. CASE, therefore, offers a predictable benefit of approximately $300,000 per year for this shop. The site would also derive substantial indirect benefits from improved maintenance and program quality.

Assume that a specific mission-critical application is tied to 20% of corporate revenue. The mission-critical application at our typical site, therefore, would be integral to efforts generating approximately $100 million per year. In addition to boosting programmer productivity, CATI can help protect that figure from several potential losses.

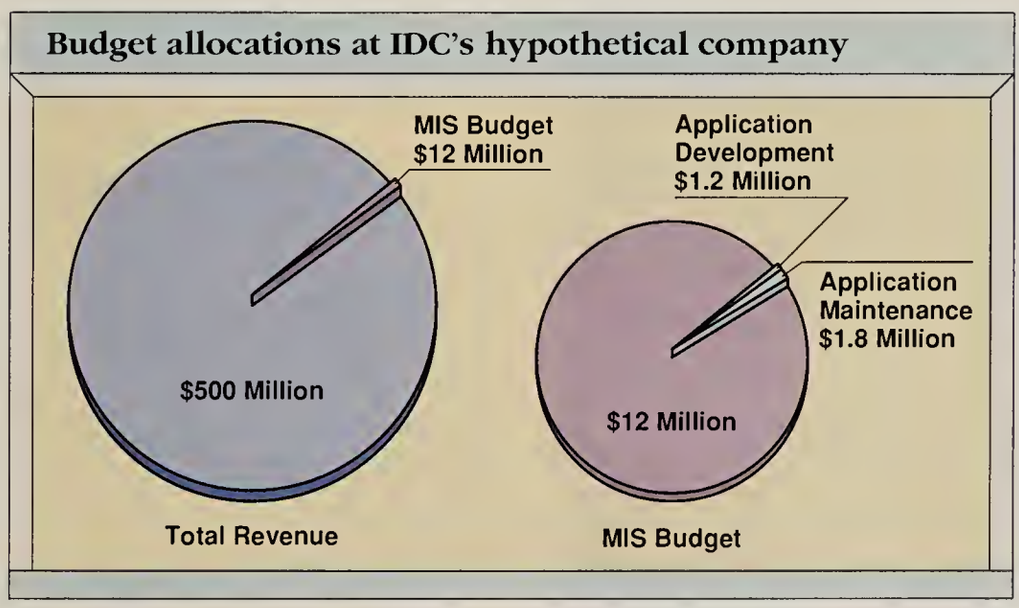
Every hour of downtime costs $2,000 if the system is running 24 hours per day. One day of lost operations per year would represent a total loss of $50,000. More insidiously, a 1% error rate – the equivalent of failing to sell three sellable seats on a 300-passenger airliner – would amount to $1 million per year. Detecting and preventing this error would generate savings equal to three times the expected savings from CASE implementation. With this type of savings, CATI payback periods can be measured in months, rather than years.

WHY DOES MANAGEMENT OVERLOOK CATI?

Today's systems are aging rapidly. This is a result of both business and technology advances. These existing systems are continually revised, and in many cases, completely redesigned and rewritten. The migration from hierarchical to relational database technology is an evolutionary phase that nearly everyone has made. Every effort was, and is, made to affect this process transparently to users. The next step is migrating from the current relational models to object-oriented databases. This step must also be accomplished with minimal impact on users. In order to guarantee this smooth and orderly conversion, the applications staff must have the automated assistance of CATI.

CASE offers clear economic justification in commercial applications – the reduction of existing programmer costs. CATI's benefits are more subtle, but once realized, can dominate those promised by CASE. One way to think of CATI is as an insurance policy. It may be expensive, and it may never be needed, but when it is, the payoff is large. IS setbacks occur in different forms. Some can appear as severe reductions in online system availability. Some will arise when systems experience high-volume peaks. Others will occur when migrating from one system to another. CATI can identify these problem areas before IS implements new applications. Despite these pronounced advantages, bottom-line-oriented top management may be reluctant to spend money on something that may or may not pay off.

Today, justifying CATI must go beyond



In order to illustrate the benefits of CATI, IDC set up a hypothetical company and gave it a realistic budget.

One programmer's phrase even upper management understands.

Ooops.

If you've heard it once, you've heard it a million times. Usually followed by a lengthy technical explanation. But what it all really means, in layman's terms, is problems. Big problems.

And no technical explanation is necessary. Because software program errors are no longer just technical problems. They're *business* problems.

The kind that can turn customers away. The kind that can show up in the papers. Or the annual report.

It's no secret that software development is a complicated and time-consuming process. What's not as well understood is the potential for problem—the long-term impact—of less than thorough software testing.

That's where Compuware comes in. With tools for automated testing, simulating real use, and quickly diagnosing and debugging errors.

Compuware offers your business something you may not expect from technical products. Results.

COMPUWARE

the traditional piecemeal approach based only on productivity gained by each testing tool. This is perhaps easier than the detailed and sophisticated risk analysis that is also required. Ever conscious of their own bottom line, IS managers may be reluctant to incur these costs. Corporate line management responsible for financial performance must recognize that it is facing a huge risk by not implementing CATI. Management should work together with IS to evaluate potential losses and justify CATI installations.

WHAT ARE IS SHOPS DOING ABOUT CATI?

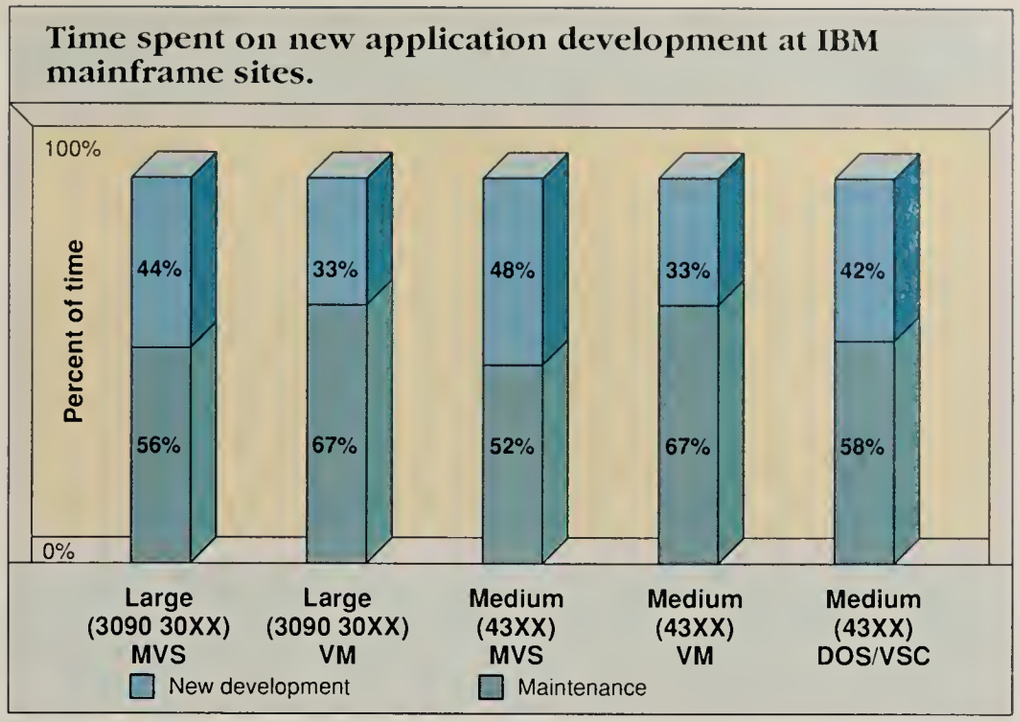
IDC application development survey respondents are typically and firmly stalled in the application maintenance quagmire. Overall, respondents are currently spending almost 60% of total programmer time on enhancements and repair of existing applications. Almost one-half of the respondents indicated that maintenance required 70% or more of their efforts. Despite the claims of CASE proponents, respondents say they expect little change by 1993. Overall, they expect to gain about 3% more time for new application development.

The continuing burden of maintenance and the application development crunch make it difficult for IS management to allocate resources for system testing and evaluation. Respondents' inability to balance their system development life cycles clearly demonstrates this problem. Managers at our survey sites indicate that they are currently allocating slightly over 50% of their total system development life cycles on code generation and program debugging. Less than 20% of total programming time is available for system testing and evaluation.

The number of shops that ignore testing and evaluation, or perform it on an ad hoc basis is alarming. Over 16% of those surveyed do little or no formal testing and evaluation for their new applications. As one industrial user stated, "We do our testing when we have time, or when we are introducing a critical new product. But overall our approach is strictly ad hoc."

Respondents in general report that older CATI tools, including debuggers and online editors, are important parts of their application environments, while newer tools, such as simulation tools and integrated environments, will become increasingly important during the next several years.

The increasing interest in CATI is spurring plans to acquire new tools and systems. Almost 50% of our respondents say they now expect to add new testing and implementation tools in the near future. Even more see a need to add integrated environments.



Maintenance continues to outweigh new applications development at Big Blue sites.

IS plans to install CATI will, in part, reflect the concerns of corporate chief executive officers and board members. The American Airlines problem emerged in a financial review by the board of directors rather than from IS. Financial shortfalls burden line management and corporate executives. They are the decision makers best able to evaluate the requirements for, and the economic viability of, enhanced CATI capabilities.

Survey respondents clearly expect senior management to recognize the need for application testing. The publicity that has accompanied recent system failures should significantly increase the visibility of testing and evaluation efforts.

A BRIEF HISTORY OF APPLICATION DEVELOPMENT

Early software developers in the late 1950s and early 1960s routinely automated manual processes by analyzing the work flow and duplicating the existing processes and procedures with computer programs. The emphasis was on understanding the process and then writing programs to significantly reduce both the time and personnel required to complete the manual processing effort. Little thought was given to process simplification, redundant functions and data, or interfaces to other systems.

The programmer functioned as business analyst, systems analyst, coder, tester and documenter of the system. Often the system design consisted of little more than pencil sketches of the process flow and identification of the programs and files required. The primary emphasis was on developing the program flowchart that explicitly defined the decision logic and actions required by each program in the system. Programming teams were small, typically one to five people, hence communication between team members was easily accomplished.

The Emergence of the System Development Life Cycle

In the mid to late 1960s, as organizations began to develop larger and more complex systems with larger programming teams, they found a need to formalize the system development process. System development life cycle methodologies began to emerge that addressed what steps or tasks had to be done and when, to ensure that the system would perform as required by the user community. Typically, most industrial-strength system development life cycles were broken down into life-cycle phases and tasks that defined the major categories and the necessary steps within each phase. The typical phases were planning, analysis, design, development, implementation and maintenance.

The use of this type of approach was characterized as "bottom-up" or "straight-line" development, as most practitioners fully completed phase 1 and obtained user sign-off before proceeding to phase 2. It was typically not until phase 4, which often

came months into the project, that any programs were written. Then it was necessary to fully develop and test each program, integrate programs into subsystems and integrate the subsystems into the overall system.

This often led to significant delays and frustrated users because bugs in the interface programs and the JCL were not found until late in the project. By then, time was short and most of the budget was spent. As a result of these factors and the lack of automated testing tools, test data development was typically left in the hands of the developers, not the users.

Throughout the 1970s, most corporations continued to focus on formalizing their system development life cycles to accommodate the structured design and programming methods being introduced by DeMarco, Yourdan, Gane and Sarson and their compatriots. These methods focused on specific techniques to develop high-level logical models of the system. Then, through a series of stepwise refinements, these techniques first decomposed the logical model into formal design specification requirements and finally into structured programs.

The use of these techniques gradually led developers to recognize that the programming effort could begin immediately after the system boundaries were set and the overall flow determined. However, getting programmers involved as early as phase 2 on such tasks as coding and testing high-level logic and all system interfaces, led to restructured development teams. More debugging aids were also used as testing was conducted throughout the development process.

In a new twist, many organizations also found that end users could become involved in the development process because of their ability to develop realistic test data.

Offsetting the "Waterfall" Approach

As analysts and designers gradually refined the specifications, program details were added to the skeleton programs already created. This process of specification refinement and programming enabled developers to show users increasingly complete results much earlier in the development process. It also allowed them to elicit user feedback while there was still time to make corrections.

Although this approach alleviated many of the problems associated with the "waterfall" system development approach – wherein work is completed in large clumps before feedback is received – developers were still prone to misinterpret requirements. Even though these misinterpreted requirements were normally found when the next version was demonstrated to users, a need for faster user feedback to control project costs and maintain the schedule became critical.

Rapid-prototyping evolved in the mid-1970s to meet this need. It counteracted the waterfall approach by getting users involved early and often. Now as then, a prototype may be an analytical model, a simulation of all or part of the proposed system, pseudo code or screen/report mock-ups with realistic data. In essence, the prototype is comprised of anything that helps the user and developer more fully communicate about the system to be built.

Also in the mid to late 1970s, fourth generation languages (4GLs) began to have an impact on system development methodologies. Fourth generation languages made it feasible to build a throw-away model that simulated key functions of the ultimate system. These key functions accepted input, produced output and for all practical purposes behaved as the final system for the set of functions modeled.

Application generators, or back-end CASE tools, also produced code rapidly. These products enabled developers to implement the rapid-prototyping methodology by rapidly developing incremental versions of a system, reviewing them with the users and incorporating their feedback in the next version. This process was repeated until the system was completed. Developers were in a sense programming in a specification-like language, which significantly reduced the necessary lines of code. Although a few of these back-end CASE tools were available in the late 1970s, they were only used by very early adapters and did not have a significant impact until the early 1980s.

Many prototypes may be built in the process of developing a complex system. Most will be aimed at clarifying/finalizing user requirements. Others may help developers and designers assess database design issues related to the placement of data sets for performance. Or they may define algorithms for complex mathematical calculations, assess final hardware requirements and determine overall system feasibility.

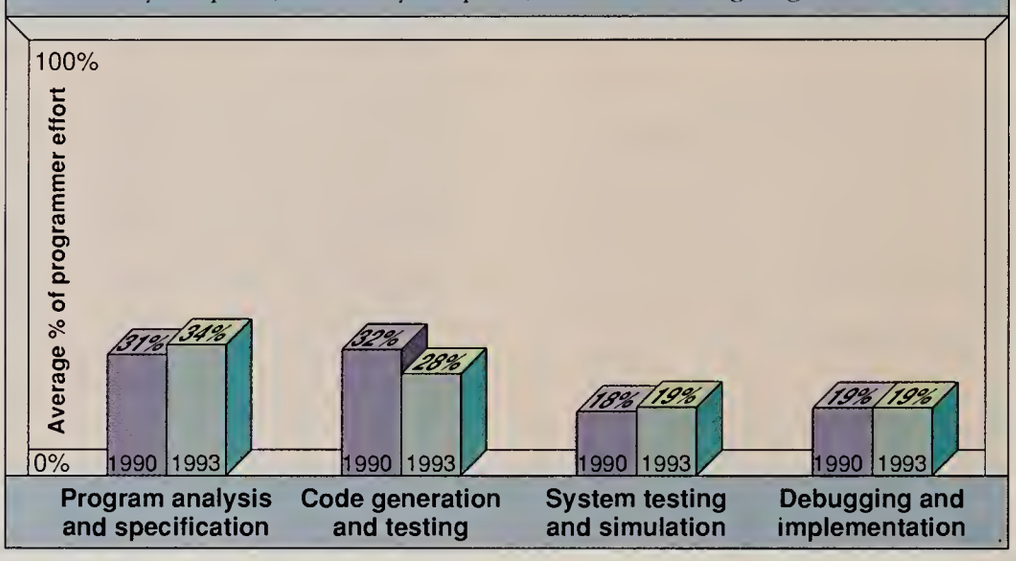
In the early 1980s, front-end CASE tools that performed initial analysis and design became commercially available. They provided graphic interfaces that enabled developers to improve their productivity as well as the overall quality of the development effort.

Although these CASE products were introduced with much fanfare, they did not meet with resounding success in the marketplace. Today, only 12% to 15% of mainframe shops are using CASE technology. This lack of market acceptance is primarily due to the failure of the early tools to meet the needs of developers. There are several reasons for this.

First, the tools were primarily focused on new systems development and overlooked systems maintenance. As mentioned systems

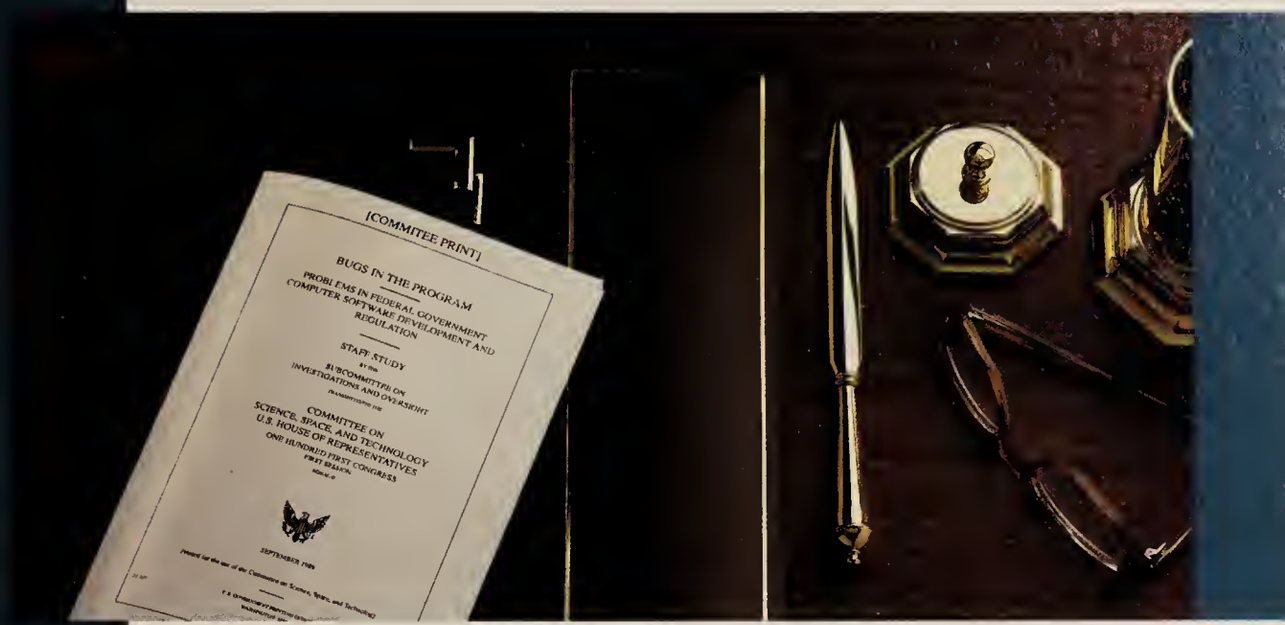
Users indicate the percent of programmer time spent on system development life cycle

Question: "Within your typical application development life cycle, how much time do you spend, and will you spend, on the following stages?"



Program analysis and specification along with code generation and testing will continue to play prominant roles.

If *they've* issued a report on it, imagine how widespread the problem must be.



The U.S. government recently issued a report on the problems of software programming errors. By doing so, they showed *awareness* of the problem, as well as a *resolve* to do something about it. U.S. businesses have been slow to do either.

Is this just another government report? Is it a problem only the government is facing? Not by a long shot.

Then just how widespread *is* the problem? Is there reason to be alarmed? Only if your company uses any software programs.

If you do, we'll be happy to send you a copy of this government report. Along with some information on Compuware's automated testing tools for software programming.

Then you can learn more about the problem. As well as the solution.

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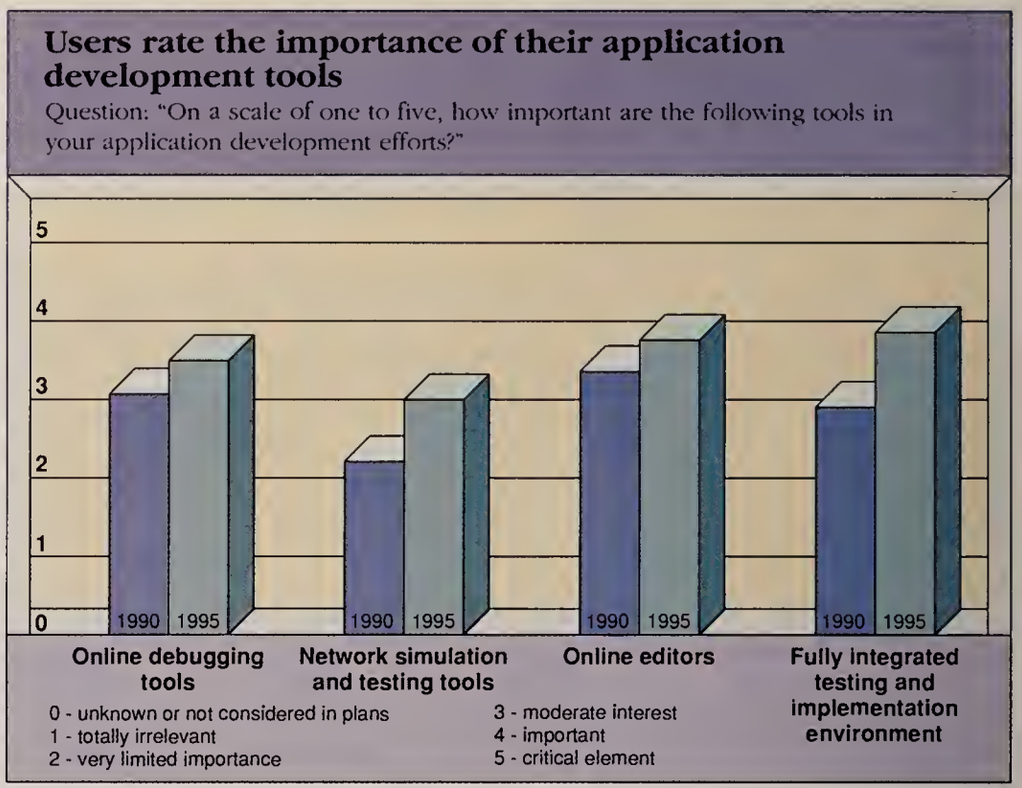
maintenance accounts for 60% of total man-hours within the average IS shop today.

Further, they did not support tool integration. For example, developers often used one CASE tool for analysis and another for design. And CASE productivity gains were difficult to quantify. Most IS shops did not have an adequate history of performance metrics to quantify and cost-justify the productivity gains from CASE.

Finally, CASE products did not support flexible applications. Developers needed flexible software that could be easily adapted to new technology and new methodologies.

Only recently are CASE products arriving that meet developer needs. Application development frameworks are being introduced that allow developers to integrate the tools from several vendors and perform all of the tasks associated with system requirements, design and code generation.



Users indicate a clear, if gradual, movement toward integrated CATI.

THE IMPACT OF SAA

IBM's Systems Application Architecture (SAA) emphasizes the need for meticulous test and evaluation procedures. SAA codifies IBM's view of the information processing environment of the 1990s by describing how all IBM computers will be able to intercommunicate. One key SAA concept describes distributed- and cooperative-processing environments. It will be implemented in both development and production processing arenas.

Developers working in an SAA environment will use programmable workstations as their primary development tools. However, the actual application development processing may occur on mainframes or servers connected to the developers' workstations. In order for this scenario to become reality, testing and debugging tools that are supported on all SAA platforms must be developed.

In the SAA world, users may enter their requests from a workstation running under OS/2. The requests will then be routed through a Unix server and transmitted via a Systems Network Architecture (SNA) network to a remote mainframe. It is unimaginable to think that anyone could design, develop, test and implement a quality application in so complex an environment without CATI.

Today, virtually all system failures can be traced to software, hardware or communications sources. Cooperative processing complicates these problems beyond simple comprehension. Software, hardware and communications are joined by the synchronization of data at the mainframe, server and workstation levels. Again, realistic problem resolution will not be possible without CATI.

LEADING-EDGE USERS

CASE and CATI are coming of age at about the same time. Leading-edge users are just beginning to realize the potential benefits of CATI tools. However, the situation is changing. Results from IDC's survey indicate that 60% of respondents will have some form of CATI installed by 1995.

We asked three leading-edge users to describe their experiences and help us convey the actual impact of CATI tools in their environments. These users represent a broad cross section of CATI users. The first user experienced significant programmer productivity gains in addition to increasing system availability dramatically. The second user used CATI tools to facilitate a major hardware/software conversion effort and retained the tools for application development. The third user determined that CATI tools offer a documented, supported alternative to internally developed utilities in a distributed application development environment.

Peerless Insurance Company

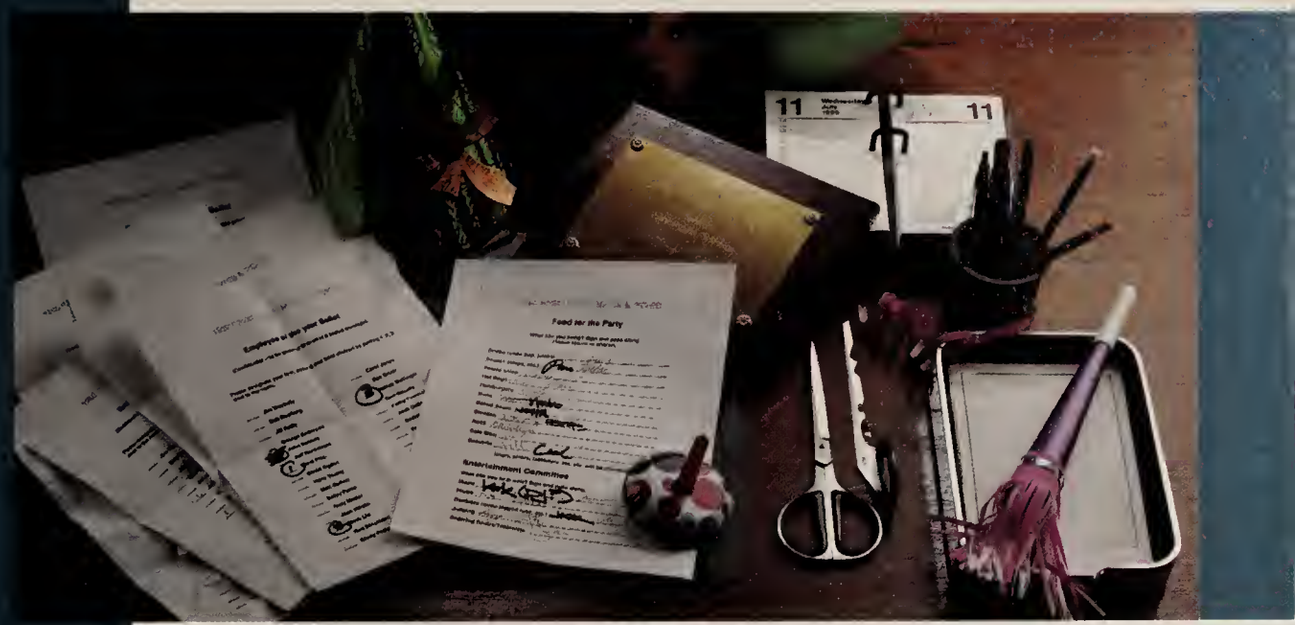
Peerless, a subsidiary of Nationale-Nederlanden North America, is an insurance company with offices in Keene, N.H. It is an IBM 3090 shop, which recently upgraded to a 3090-180E. Peerless handles most traditional insurance applications, including policy management and claims disbursal. It has experienced some normal problems with system availability. One problem in particular plagued the draft-processing program, which dispatches payments to claimants. As Russ Burns, systems consultant notes, "This is the type of application that generates a lot of heat when it goes down. Not much light ... but a lot of heat."

Peerless installed CATI tools to deal with these kinds of seemingly trivial problems that nonetheless were very difficult to pin down. Before CATI, IS was running at about 98% availability, with CICS regions going down approximately once every two weeks. Based on initial investigation and educated guesses, IS expected to find that 50% of the downtime resulted from storage violations under CICS. The group thought its CICS programs were looking for information that was either in the wrong place or the wrong form.

Peerless' management decided to bring in CATI tools to trap these storage violations. Storage violations are difficult to detect because they often lie buried in the logic of complex subroutines. They can be unearthed with storage violation trapping. This process traces the errors and pinpoints the errant code lines. The time-tested and highly unpopular alternative involves reading dumps that describe CPU memory contents.

Burns and other managers also recog-

Some companies spend more time planning for office parties than for devastating software crashes.



It's a rare company that doesn't spend weeks, even months, planning office soirees. And yet few companies devote the same energy to anticipating software problems that could quickly take them out of the party mood.

Why? It could be that time and other factors form a perceived barrier to thorough software testing. But the potential for problems from less than thorough testing is well known: a *singl*e software error can have serious effects on a company's business.

Compuware's automated testing tools for software programming work to eliminate these problems in a variety of ways. But they will only do so if they are a *planned* part of the testing and implementation process.

Plan to have Compuware get involved in your next project. Then, the only crashes you'll have to worry about are people who crash your office parties.

COMPUWARE

nized that in addition to trapping storage violations, CATI tools would improve application programmer productivity. They knew these productivity gains would be icing on the cake if they could cost-justify the new software based on increased availability. Their calculations indicated that they could justify the software acquisition if the tools helped programmers find half of their storage violations.

"The hard justification would follow easily from increased availability," Burns notes. "Based on the hourly cost estimates we used for planning, we estimated that eliminating 25% of our downtime problems would result in a payback period of less than 18 months."

Their estimates proved to be conservative. Peerless programmers were able to identify storage violations that generated virtually all of the CICS region downtime. The problems were relatively simple. In one case a program placed information in a specific position and passed the address to another portion of the program. Unfortunately, still other parts of the complex program overwrote the information before it could be used. This and other storage violations were sometimes painfully obvious once the CATI tools highlighted problem sources. Without CATI, the best programmers may never have found the problems in the briar patch of assembler language code.

The fixes indicated by the CATI products increased availability to over 99%. The savings in CPU time alone justified their acquisition in less than six months. The fringe benefits, including better production programs, fewer production problems and increased application programmer productivity, continue to accrue for Peerless. "This was the best software acquisition decision we ever made," Burns declares.

IDC asked Burns which CATI features mattered most to application development programmers. He mentioned three. "First, application development programmers need source code-level debugging to facilitate corrections. Second, they need the ability to trap storage violations within macro assembler. And third, they need a user interface that's easy to learn. Our people who were used to CICS debugging were very pleased with our acquisition."

The bottom line, however, focused on availability and user issues. "The biggest impact of our acquisition was on our user clients," Burns says. "They saw better than a 50% reduction in downtime. And we save directly on system cost. A CATI purchase should be easy to justify to management based purely on hard dollars associated with availability without resorting to claims of increased programmer productivity. You can home in on the problem without tons of paper."

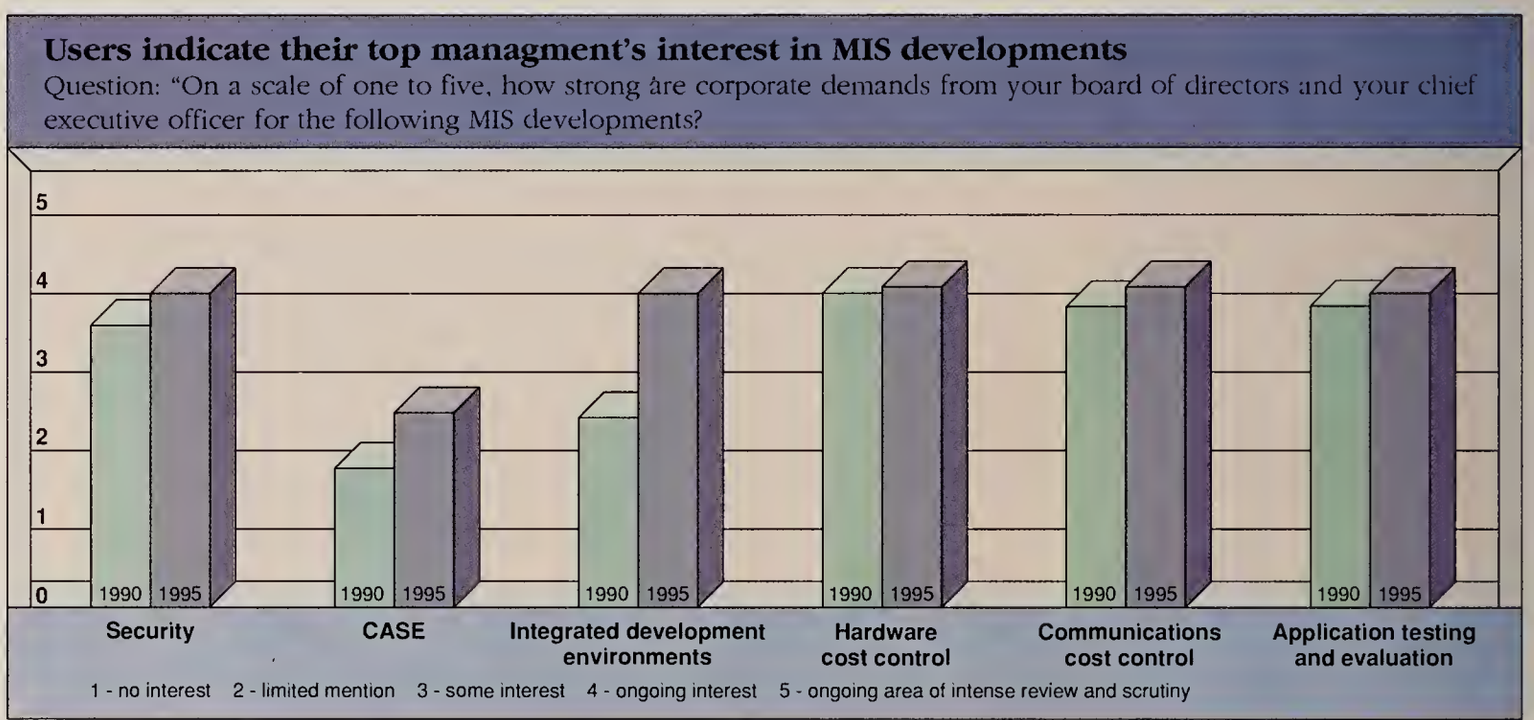
In mid-March 1990, the data center resources from Nationale-Nederlanden North America were consolidated in Indianapolis, Ind. While a significant portion of the application development staff from Keene was relocated to the new information home, a core application development group remained to supply local support. CATI tools have become increasingly important to this staff, as it will not have continual contact with a large number of associate developers.

Federal Home Loan Bank

The Federal Home Loan Bank (FHLB) concentrates on relatively low-volume/ high-value transactions. It was previously running check processing on several Burroughs systems at regional sites. IS developed software centrally and downloaded to remote systems. However, increasing loan volumes led the bank to a central IBM system linked via channel connect to check processing systems at the remote sites. The migration to IBM also led to changes in testing and implementation strategy.

According to Jerry Bassett, FHLB vice-president of MIS, "We recognized early in the planning stages that we would be moving to a very different testing and debugging environment. Our programmers were comfortable with the Burroughs environment, which provides considerable support for application testing and debugging. The IBM environment is quite different. We decided to use CATI tools as an alternative to working our way through the dumps from IBM."

CATI tools represented a key part of the bank's migration process. It had a relatively small application development staff, which was introduced to the IBM system and JCL. Several additional programmers came on board to handle some of the IBM system's



Users anticipate more top management interest in application testing and evaluation than they do in CASE.

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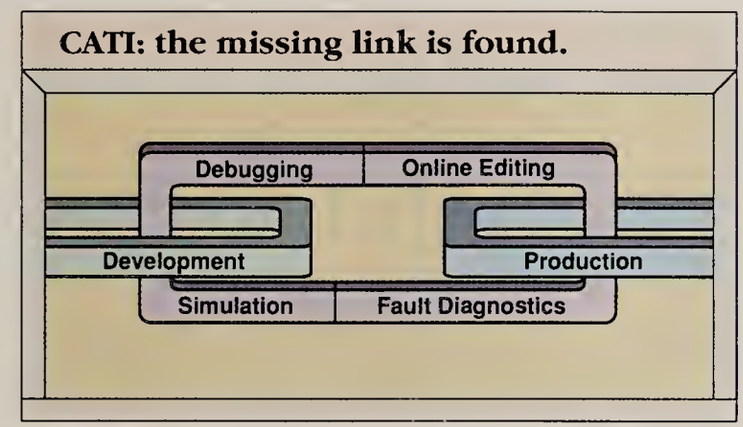
quirks. Testing tools significantly simplified their tasks.

The selection process was straightforward. The bank brought in the major contenders and quickly evaluated each product. Staff members were familiar with the products and reached a consensus on specific tools. FHLB also looked at larger, more complicated application software packages with some built-in assistance but decided that smaller was better for its needs.

The transition period went smoothly, although some programmers found the IBM environment difficult and cumbersome at first. Ultimately, however, they came to appreciate the greater power and flexibility at their installation.

The FHLB staff migrated 18 major systems onto the IBM hardware, working primarily with VSAM files and making extensive use of CATI tools. The staff complemented the testing environment with traditional parallel runs and test periods, permitting a final migration of all 18 new software systems in one day. As Bassett says, "We would have made it without the tools, but we wouldn't have done it in the same time frame."



Debugging, simulation, fault diagnostics and online editing are the key building blocks of CATI.

Boise Cascade

Boise Cascade offers a third perspective on the benefits of CATI. The company maintains a highly distributed application development environment. Central facilities provide support, training, consulting and new product evaluation for the distributed application development centers.

Programmers in the application development centers developed numerous utilities over the years. However, maintaining and documenting these utilities represents a significant problem. The programs offer various types of interfaces, including control cards and switch codes. Users must remember multiple interfaces and operating characteristics.

CATI offers the benefit of a single consistent user interface. Existing products also provide active vendor support and strong documentation. These latter qualities become even more important as Boise Cascade evaluates strategies for implementing the integrated approach of AD/Cycle.

The decision to install CATI tools was easy. According to Gerry Hough, lead programmer analyst, "We do not require extensive cost justification. We work by the seat of our pants, allowing us to use our collective experience and judgment to determine if specific software packages are worthwhile. Those of us who have been here long enough know."

Hough's staff set up procedures for users who were accustomed to specific capabilities in the old utilities. Application development programmers are now actively using the new tools. "We see lots of demand for resources to handle the utilities," Hough says. "This is one product that just serves their needs. And the vendors provide support and documentation."

Hough reports he realized significant savings during a recent conversion. "It happened that I was doing both the conversion and the evaluation, so I knew the product from both sides. We saved many hours during that particularly huge conversion job."

Boise Cascade still sees additional requirements. In particular, the company is interested in obtaining CATI capabilities on PC development systems. "We need to be able to develop and test using mainframe-size file structures. The lack of test file manipulation facilities and LAN change management control products is slowing our move to PC development platforms," Hough notes.

MANAGEMENT RECOMMENDATIONS

The overnight batch system of 10 years ago could easily absorb errors and ad hoc testing, evaluation and debugging operations. The networked online transaction processing systems that form the core of applications in the 1990s are far less tolerant. Errors that meant long night hours for systems programmers in the 1970s may mean millions of dollars in lost revenue in the 1990s. Corporate management must respond to the obvious economics of enhanced testing and implementation tools.

It must also recognize that CATI offers positive competitive advantages in addition to reducing the impact of problems. Systems that sustain unexpected loads through testing and planning can provide significant corporate advantages. How can management gain access to these benefits? There are several steps:

- Review your planned and installed mission-critical systems. Be sure that you and your board of directors understand the extent to which you rely on specific systems for the ongoing operations of your corporation.
- Evaluate the cost of downtime. Develop a clear, although not necessarily exhaustively detailed, concept of your financial loss if your systems are unavailable.
- Evaluate the cost of possible errors. What will your company lose if your systems sustain a 1% error rate?
- Develop a methodology for identifying possible systematic errors. How would you know if your system errs significantly? You should identify conditions that indicate potential problems. Many large shops have installed, or are installing, executive information systems that alert senior management to problems by department, operating group or functional activity. Recognize that mission-critical applications are as important as physical production processes. Develop the same types of alerts and exception reports for your systems.
- Ensure that IS recognizes the importance of thorough testing and evaluation – and provides the state-of-the-art tools for required monitoring performance.

Complex information systems will determine the ability of today's corporate leaders to deliver the quality their customers deserve and the profits their boards demand. However, increasing corporate reliance on these systems, and exponential increases in their complexity, are exposing these corporate leaders to tremendous financial risk from catastrophic system failures. IS executives must remain vigilant in their efforts to minimize these risks.

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COMMENTARY

Patricia Keefe

Not quite a landmark

Just a blip on the legal screen? Many copyright attorneys said they think U.S. District Court Judge Robert Keeton stuck to the middle ground in his decision against Paperback Software International and so are unwilling to grant the ruling "landmark" status.

"If he had ruled against Lotus, it would have been shocking," said attorney Lee Gesmer, a partner at Boston-based Lucash, Gesmer & Updegrove, which also publishes the "Technology Law Bulletin." "But he did the easy thing." Gesmer said that Keeton's 115-page ruling gives Lotus the foundation on which to sue competitors who copy, to a greater or lesser extent, the structure or sequence of its menu.

Meanwhile, Gesmer suggested that it would be a "smart thing" for Borland International to discontinue its Lotus 1-2-3 menu option until the copyright infringement suit is settled. Every copy Borland sells with that option could put profit into Lotus' pocket *if* Lotus wins, he pointed out.

To drop the option isn't necessarily admitting any wrong-

Continued on page 61

Users stick with diehard 286

Low price keeps 286-based machines selling, despite lack of power

ANALYSIS

BY RICHARD PASTORE
CW STAFF

If Bruce Willis is unwilling to star in a *Die Hard III*, Hollywood could cast the 286 chip in his place. The Intel Corp. microprocessor has been knocked out of the limelight and kicked around for more than a year, but it keeps on fighting and winning users over.

For the month of April, five of the top 10 best-selling computers sold through U.S. computer specialty stores were 286-based, according to Storeboard/Computer Intelligence in Dallas.

Why are so many people still buying the relatively slow 286? A lot of users simply want a bargain or cannot afford to pay more for power they do not yet need, said Dan Ness, personal computer analyst at Computer Intelligence in La Jolla, Calif.

Users validated the point. "As long as IBM makes the price attractive, and I have a limited number of dollars to work with, we'll continue to buy" 286-based business systems, said Tim Thompson, senior PC analyst at St. Mary's Medical Center in Evansville, Ind.

While the price of desktop PCs based on Intel's 80386SX chip has come within $200 of the cost of 286 boxes, the difference can add up. "If you're buying 5,000 of them, the nominal price difference can be an important factor," Ness said.

"You can pick up some of those [286 workstations] for around $1,000, so it's a very economical purchase," said Jane Kosek, microcomputer manager at Dekalb-Pfizer Genetics Corp. in De Kalb, Ill. Though the company has standardized on 386 technology, it is considering 286s to replace minicomputer dumb terminals. "These are for people who have never used a PC and only do word processing. We don't think they need anything more powerful," Kosek said.

286 justification

Applications such as word processing and simple spreadsheets are justifying 286 purchases in many companies that prefer to buy 386 CPUs.

"For those kinds of uses, it's a perfectly adequate machine," said Agnes Bacon, PC coordinator at the Cleveland Clinic.

To a limited extent, vendors are still paying attention to the 286 market. Even high-end champions such as Compaq Computer Corp. still offer a limited number of 286 machines, including a new model introduced this spring.

Zenith Data Systems has not totally written off the market. Two weeks ago, it unveiled a 286 desktop PC that can be upgraded to a 386SX [CW, July 16].

Zenith cited research that says 7 million 286 boxes will be sold worldwide this year.

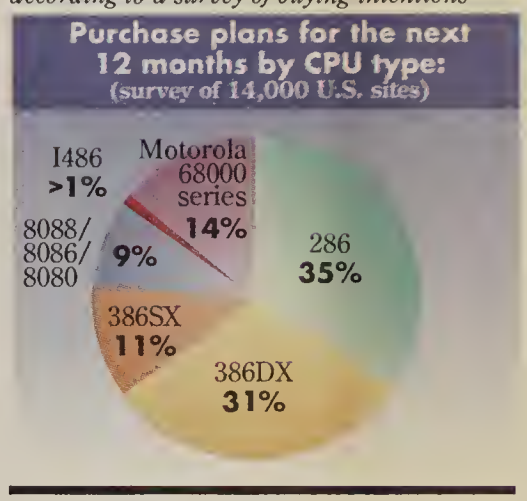
"Anything that has that much volume is certainly still a viable market," said product manager Rusty Graham. "I see the 286 being the highest selling computer for the next couple of years" before the 386SX surpasses it.

In addition, at least 4.5 million 286s are expected to sell yearly through 1995, Graham said.

"It will still have a viable life," he added.

Where the chips fall

Despite gangbuster sales growth of Intel's 386SX, 286 unit sales will still predominate, according to a survey of buying intentions



Source: Computer Intelligence — CW Chart: Paul Mock

Dell Computer Corp. Chief Executive Officer Michael Dell said the 286 could be a hot seller at the right price. "If we get the 286 machine under $1,000, it becomes a throw-away item. Like a telephone, they'll buy it for everybody."

Yet many manufacturers are not putting their desktop development dollars where their mouths are. A Zenith spokesman said the new machine will likely be its last 286 developed for the desktop. NEC Technologies, Inc. is concentrating development efforts on the 386 and SX areas, not the 286, according to David Middleton, manager of PC product marketing.

The 286 "is a cash cow, and vendors want to milk it for what they can while it's still around," Ness said, referring to the lack of new development.

Street prices for 286 desktop PCs will continue to drop, analysts said, making the boxes even more attractive in the near term. But observers anticipated that the eventual rise of 32-bit applications will deal a final death blow to the desktop 286.

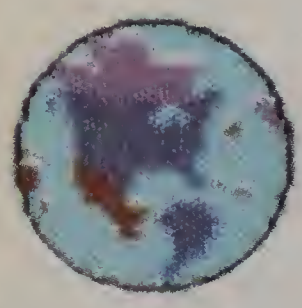
"The motivating factor is new software that uses the 386 memory-handling capabilities" such as Microsoft Corp.'s Windows 3.0, said Phil Mooneyham, microcomputer technician at Emerson Electric Co. Industrial Control Division in Santa Ana, Calif. The company stopped buying 286s three months ago, he said.

The portable computer arena will serve as a rest home for the chip for at least a couple of years after it retires from the desktop, observers said. "The portable tends to lag behind the desktop market, so for most applications the 286 is sufficient," a Zenith spokesman said.

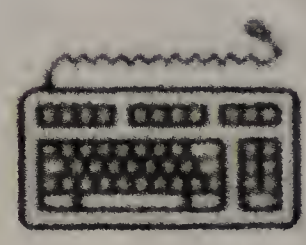
Notebook-size PCs may be the final refuge for the 286, because the extremely small form factor and price pressure preclude the use of more advanced processor-based technology for the near future, observers said.

Printers

386 Enhanced



International



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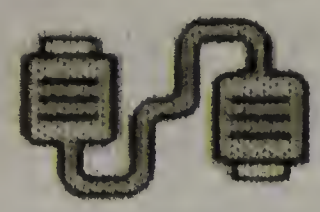
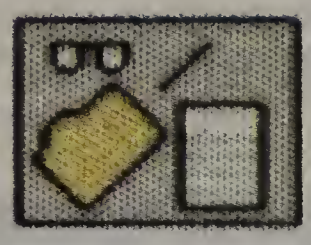
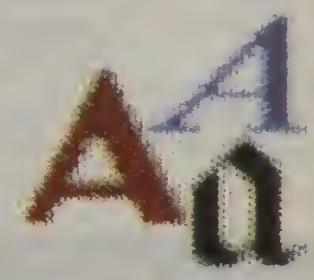


Networks

Ports



Desktop



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New York's fare-card system to stop foul play

ON SITE

BY RICHARD PASTORE
CW STAFF

NEW YORK — "Token-sucking" is the latest scam New Yorkers have adopted to cheat the subway system. The thief wedges a piece of paper deep into the turnstile token slot and then uses his mouth to suck out the $1.15 tokens that passengers deposit in the jammed slot.

This revolting ploy, as well as the more serious token-booth robberies, should become a thing of the past after a personal computer-based fare-card system replaces the old token-based operation. This and several other PC applications are part of the New York City Transit Authority's long-range plan to derail its minicomputer infrastructure in favor of mainframes and decentralized, distributed client/server computing.

"We have eight different minicomputers," said William Heuser, vice-president of the information services division. With so many minicomputers from different manufacturers, "we have a difficult time moving data from one system to another," he said.

The goal is to migrate minicomputer applications to networked PCs or mainframes as appropriate and develop new applications to run on PCs and servers.

One of the newest applications involving PCs is the Gateways program, a six-year conversion plan that will have all New York public transit riders paying fares with magnetically encoded cards rather than coins or tokens.

New CPU-outfitted turnstiles and fare-card vending booths will accept and issue the plastic cards. Intel Corp. 80386-based PCs will collect fare data from up to 100 turnstiles and vending booths at each of 440 subway stations.

New York's *beleaguered subway system is in for a PC overhaul*

The 386 boxes will in turn upload the fare and ridership data in 5- to 15-minute intervals to a host Digital Equipment Corp. VAX, which will generate reports of passenger flow and fare totals. The Authority chose this multitiered system to ensure that communication failures on any particular tier would not bring the whole transit system to a screeching halt.

The card system offers several advantages over the tokens, according to Richard Trenery, assistant vice-president and manager of the project.

"In a token-based system, there is no data collected," Trenery said. "With the electronic turnstiles, we capture data on passenger flow, which we can use to optimize scheduling."

Savings on token manufacturing and handling costs combined with the reduced possibility of fare cheating and robbery will pay for the $700 million Gateways program in four years, Trenery said.

Another PC system in the making is the Rapid Transit Operations Decentralization Network, a series of three local-area networks linking 200 PCs. The LANs will be up and running by the summer of 1991 at each of the Authority's three independent subway organizations.

Train dispatchers will initially use the PCs to enter and update operators' route and scheduling information. Currently, driver routes and schedules are drawn up four months in advance and entered into a centrally located Prime Computer, Inc. 6350 minicomputer. Updates and changes take about four weeks to print and distribute to all the stations.

Under the present system, "By the time the dispatcher gets the computer printout, the schedule is three months old," explained Karl Klass, senior director of strategic planning. Resignations and vacations occurring within the lag time have been known to cause last-minute pandemonium at the stations, he said.

The decentralized LAN system "allows the computers to be where the action is," Klass said. "The best way to run efficiently is with decentralized systems."

Costly venture

Over a five-year period, total cost for the program ($5.4 million) will exceed expected total savings payback ($4 million).

"We're spending more than we're getting in the short term," Klass acknowledged, "but we're setting the framework for the future and improving the way we run our business."

Other PC applications already in place include a database containing information on the subway system's tracks and switches — repair histories, incline grades and type of steel used in particular rails, for example.

With the database, engineers can determine which sections of rail are ripe for repair. For example, the historical data reveals that one straight track on the Broadway line has not been repaired since 1936.

Previously, there was no systematic record of this information. Rail repair histories primarily resided in the memories of veteran track engineers, according to one subway official.

"Having it down in a computer database is a much more well-organized way of doing this," said Roger Hughes, manager of planning and information systems for track construction. "It gives us the ability to plan more than a year ahead."

Low-cost accounting tools begin to catch on

BY PATRICIA KEEFE
CW STAFF

"Good stuff cheap."

That's a marketing pitch just waiting to be co-opted by a growing raft of developers of low-cost accounting and financial software trying to attract both the bean counters and the number crunchers in Fortune 500 firms.

There was a short-lived trend about two years ago, when many of the leading software vendors, particularly in the database segment, hiked prices up 5% to 10%. There were some developers who were hoping to make a killing with high-priced OS/2 versions of their packages, but that market never took off.

More recently, Borland International took a page out of the price wars that have been decimating some microcomputer hardware segments. The firm launched an aggressive campaign that offered users who trade in Lotus Development Corp.'s 1-2-3 spreadsheet a copy of Borland's Quattro Pro for $99. Borland, which pioneered cut-rate pricing, claimed the promotion has significantly boosted its market share and revenue.

Companies such as Lotus and IBM, meanwhile, are making noises about addressing the low end. IBM introduced its Personal System/1 home computer, while Lotus has indicated it will pursue this market via new products and alliances such as its agreement with Great America Software Co.

Price-cutting pioneer

The spate of price cutting, along with the move to embrace the so-called Fortune 2 million, probably amuses Jose Hurtado. He developed Daceasy accounting software in 1985, which gained fame as a robust accounting package for less than $50 at a time when most accounting packages were selling in the $5,000 range.

Hurtado sold his interest in the then-$15 million DAC Software, Inc. in 1987 to found M-USA Business Systems, Inc. Daceasy is now priced at $149. In March, Hurtado introduced Pacioli 2000, an eight-module, network-ready, single-system accounting package that sells for $50. He claimed that Pacioli — named after Fra Luca Pacioli, the 15th century father of accounting — is even more robust than Daceasy and many higher priced systems.

He said his biggest problem lies in surmounting price prejudice: Users assume anything that inexpensive cannot possibly be any good. The product has received glowing reviews.

To hear Hurtado tell it, he can make a reasonable profit selling fully featured software, complete with free technical support, for $50. "The book, diskette, packaging, agreement and brochure all cost $8.50 to produce," he said. Plus, Hurtado is operating on an assumption that happy Pacioli 2000 buyers will bypass discounters and purchase his business forms.

"He's dreaming," scoffed Nancy McSharry, a software analyst at market research firm International Data Corp.'s Mountain View, Calif., office. Mosaic Software, Inc. tried that same tactic with Mosaic Twin, a low-end 1-2-3 clone that it expected would pull in sales for its other, more typically priced packages. It failed to do so, McSharry said.

She urged buyers to be careful. If it sounds too good to be true, it might be that either the support is shaky or that the base package is cheap, but add-ons punch up the price.

Sun eases DBMS interfacing with new tools

BY JAMES DALY
CW STAFF

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. recently moved to stitch together with a single interface the disparate and competitive relational database management system offerings of Ingres Corp., Oracle Systems Corp. and Sybase, Inc.

In other news, Solbourne Computer, Inc., a manufacturer of Sun-compatible computers, offered a new server model that contains up to eight CPUs, and Sun rolled out a series of hardware offerings that increase server performance.

Sun introduced SimplifySQL, a set of software tools that provide a single interface for the three RDBMS applications. Informix Software, Inc. products will be added to the fold by the first half of next year.

Through SimplifySQL, Sun can use the Open Look interface to access and manipulate the databases via pull-down menus and point-and-click mouse controls. In the past, users would often have to memorize and type in sometimes complicated SQL commands, which often differ from one DBMS to the next.

International Data Corp., a market research firm in Framingham, Mass., stated that nearly all Fortune 1,000 companies run two or more DBMS products.

Sun officials said they performed initial product development with Ingres, while Oracle and Sybase provided technical assistance.

Although SimplifySQL could feasibly be used on any non-Sun machine, product manager Jonathan Richards said such use would constitute a violation of the software license.

SimplifySQL is another attempt by Sun to work its way into the hearts of RDBMS users. Sun previously announced its Database Accelerator application, which increases the database performance of Sun's servers by boosting system throughput and cutting response time, particularly under heavy system loads.

Sun officials said that SimplifySQL costs $995 and will be shipped within 90 days.

Solbourne's Enterprise Server is a 40-MHz rack-mount setup that offers both a single-processor version and a dual-processor multiprocessing configuration. The Enterprise Server can be configured with more than 1G byte of memory. Starting prices range from $89,900 for a single-CPU system to $605,000 for an eight-CPU system.

The Longmont, Colo., firm also announced an array of price decreases in memory, CPU board and small computer systems interface disk storage.

Hardware enhancements from Sun included the Network File System-based accelerator board, which increases the number of workstations that can be supported by the Sparcserver 470 and 490 and promises to improve response time by up to 75%. It will sell for $5,995.

A faster version of Sun's standard Intelligent Peripheral Interface disk drive doubles I/O transfer rates from 3M to 6M byte/sec. The price will remain the same, $14,500.

A 128M-byte memory board for the Sparcserver 470 and 490 will sell for $45,000 and will give the Sparcservers up to 672M bytes of total memory. Sun also reduced the price of its 32M-byte memory board from $19,000 to $13,000.

Sun will now include its compact disc/read-only memory (CD-ROM) disk drive as a standard feature on many of its Sparcservers and Sparcstations. The company has also vowed to move all of its software onto CD-ROM by next year.

Full circle for Dbase Mac

TORRANCE, Calif. — What goes around comes around: Ashton-Tate Corp. has sold Dbase Mac, its database software for Apple Computer, Inc.'s Macintosh, for an undisclosed sum to a start-up that includes the product's original developer.

In 1985, Ashton-Tate purchased Dbase Mac from Michael Rossetti, who is now chief technical officer and president of the Software Products Division at New Era Software Group, Inc., a new venture specializing in Mac software that bought the package.

"It [cost] a lot of money — that's all I can say," said Chief Executive Officer Dean Meyer, who estimated Dbase Mac's installed base at about 35,000 users. A Dbase Mac user himself, Meyer said he became frustrated over Ashton-Tate's unwillingness to develop the product further and so initiated efforts to buy the program about 1½ years ago.

By Oct. 1, he said he'll have ported the package over to Apple's System 7.0 operating system. New features will be added so "people will feel that the product, which has been dead a long time, is back in circulation," he said.

A year from now, the product will emerge rewritten in object-oriented C++, sporting a graphical front end and a new name — Nubasemac.

PATRICIA KEEFE

MICRO BITS

Compuadd to offer dial-a-consultant service

Compuadd Corp. plans to launch on Aug. 6 PC Direct Help, a 900-number support program said to cover IBM- and Apple Computer, Inc.-compatible products. Direct Help extends Compuadd's toll-free service to noncustomers for a fee; the first minute is free, with a $2 charge for each additional minute of consultation. For example, a 10-minute consultation would cost $18, which would be added to the caller's monthly phone bill. Compuadd claimed it should be able to determine within the first minute whether it can help the customer.

Mobil Oil Corp. has selected **Kinetic Presentations, Inc.'s** Words, Graphs & Art presentation software as a corporate standard. Mobil's decision was based in part on two factors: Kinetic developed and incorporated the Mobil typeface into the package, and Kinetic provided a single-vendor solution for both graphics creation and imaging. The software will be implemented worldwide by 374 Mobil automation support managers.

Microsoft Corp. will open an East Coast product support services site this fall in Charlotte, N.C. It will supplement the technical assistance now offered out of the Bellevue, Wash., site, which receives more than 8,000 calls per day. The new center is expected to attract at least 1,500 calls daily, and staffing is expected to hit 150 by the end of the first year of operation.

Keefe

CONTINUED FROM PAGE 55

doing, he added, "so why take the risk?" Especially since Spencer Leyton, Borland's senior vice-president of business development, claimed, "We feel strongly that when people try our menu system, they stick with it."

Borland's attempt to establish jurisdiction in California elicited a shrug from Gesmer. It's unlikely that a California court will issue a different ruling than the one Lotus won against Paperback Software in Boston, he said.

Nothing succeeds like success. Borland's stock took a dive after Lotus slapped the company with a copyright infringement suit. After losing about 20% of its value, the stock was inching its way back up when Borland reported record first-quarter revenue and earnings last week — up 78% from the previous quarter and 192% over the same quarter a year ago. Of course, the seemingly endless $99 Quattro Pro promotion has played a major role here, but at least one analyst thinks that campaign has just about run out of steam.

Calls to Quattro Pro users in the last few weeks revealed some small shops that have moved over from 1-2-3 and would rather fight than switch back. But most users who took the bait bought just a copy or two for evaluation purposes. At $99, why not?

In order to sustain its most recent earnings levels, Borland needs to convince the testers to become loyal users. This means that Quattro Pro has to be better than 1-2-3, maintain Lotus file compatibility and provide an easy transition for users. At least the latter is under attack from Lotus' infringement suit. Borland has gone on the offensive with a spate of newspaper ads aimed at users, which assert right off the bat that "Quattro Pro is radically different from Lotus' 1-2-3. Even if you . . . load the optional 1-2-3.MU demo file."

How to win enemies and lose friends. The most vocal users seem to be coming out against the Lotus copyright infringement suits. Some are so ticked off, they are threatening to ban future 1-2-3 purchases. This is certainly no way to attract potential customers or retain old ones. Most observers said Lotus wins will only impact users in the extreme event that a competitor is forced to withdraw a product from the market. So why the worry? Rick Sherlund, an analyst at Goldman Sachs, suggested that Lotus wins could help lock customers into its products if competitors can't offer similar interfaces.

Silence is golden. The usually talkative Borland Chairman Philippe Kahn has been off-limits to the press since Lotus filed suit. One source told us Kahn has been toning down his devil's advocate role not at the request of his lawyers, but at the bequest of Ben Rosen, now an investor in Borland.

It would seem this strategy forced Kahn to commit the worst faux pas possible during a teleconference with analysts recently — he didn't answer questions. Moderation in all things, we say.

Keefe is *Computerworld's* senior editor, PCs and workstations.

Information centers face change

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — The information center, as we have known it for the past 10 years, is no more.

Once it was a corporate resource of personal computer specialists, responding to end users' technical questions and providing computer training. But now, calls to an end-user hot line are just as likely to ring at a data center help desk, because many information centers have closed shop, industry analysts at the seventh annual Information Center Conference said recently. The information centers that survive often change their mission, becoming in-house consultants.

The art of supporting corporate end users is changing rapidly, spurred by regional recession, corporate restructuring — and the migration of centralized information centers toward geographically scattered business units.

At one time, there were roughly 15,000 to 20,000 information centers in corporate America, said Naomi Karten, a Randolph, Mass.-based information center consultant to Fortune 500 corporations. Now, no one is sure exactly how many there are, due to geographic scattering of center personnel and the different names by which information centers go. However, they remain an obvious target for the budgetary ax.

"In [economic] tough times, [information centers] are one of the first things to be cut, because it's hard to measure the benefit they provide," Karten said.

The restructuring of large corporations, designed to save money by reducing layers of management, has had a dramatic impact on information centers.

"We're somewhere between the old-fashioned hierarchical organization and the flattened organization," said Kathy J. Welch, director of telecommunications and computer services at Browning-Ferris Industries, a $2.8 billion waste-management firm with 25,000 employees and 400 sites. As a result of corporate change, Welch has moved from information center management into an information systems function.

"I used to manage two [information centers], and they're gone," said Virginia Johnson, manager of staffing and development services at General Motors Corp. subsidiary Hughes Aircraft Co. in Los Angeles. "We've taken a different approach to [information centers], which is to make them based on teams of people with multiple skills." The teams, attached to various business units, meet frequently.

Not dead yet

However, the information center is not dead, Karten said. "The [information center] used to be a physical place, but that changed as personal computer technology infiltrated the workplace in the late 1980s. The [information center] isn't dead, but it is changing. Rather than providing ad hoc, on-the-fly help to end users, it's evolving into a resource that helps business units analyze problems and suggests remedies."

Those who staff today's information center should focus less on being technicians and more on becoming business-unit consultants, said Amy Wohl, president of Wohl Associates in Bala Cynwyd, Pa. They need to think in terms of applications projects that can keep them in business in the 1990s.

"Pick projects that have very high levels of payback very quickly," Wohl advised the hundreds of information center managers in her keynote address. "Management could change, and they may lose interest in your project if it takes three to five years to complete. Make sure the people in your organization support your project and that you have the endorsement of senior management, before you even start your project."

NEW PRODUCTS

Systems

A 16-MHz IBM Personal Computer AT-compatible laptop system has been announced by Fora, Inc.

The LP-286C includes 1M byte of random-access memory, which can be expanded to 8M bytes, and 20M- or 40M-byte hard disks. The laptop also includes a 3½-in. floppy drive and an IBM Video Graphics Array backlit LCD screen. It features support for as many as 32 gray levels, and its optional expansion chassis allows the computer to take the place of a desktop system, the vendor said.

A 20M-byte hard drive version costs $4,195, and a 40M-byte hard drive system sells for $4,425.

Fora
3081 N. First St.
San Jose, Calif. 95134
(408) 944-0393

Software utilities

Easyshare, a terminate-and-stay-resident program that automates user procedures, such as transferring data by rekeying it, has been announced by Adisoft.

The product can reportedly control complex personal computer-to-mainframe sessions and operates with IBM and asynchronous terminal emulators.

System requirements include 18K to 28K bytes of memory, DOS Version 3.0 or higher and an IBM PC AT, Personal System/2 or compatible. Easyshare sells for $125.

Adisoft
664 Joaquin Ave.
San Leandro, Calif. 94577
(415) 483-5605

grams based on IBM Presentation Manager and most kernel applications, the vendor said.

The product runs on IBM Personal Computer ATs, XTs or compatibles and is being offered on request for no charge.

Elographics
105 Randolph Road
Oak Ridge, Tenn. 37830
(615) 482-4100

Selecterm, Inc. has announced a developer's edition of Microscript, a personal computer-based software package designed to act as an interface for disparate computer applications and systems.

The product reads data from a system's display buffer and writes it to the target system via a keyboard buffer. It can reportedly interface with any application that operates on a PC or that can be made accessible to a PC via terminal emulation.

System requirements include an IBM PC AT, XT or Personal System/2 running DOS Version 2.0 or a later version. The price is $1,995.

Selecterm
153 Andover St.
Danvers, Mass. 01923
(617) 246-1300

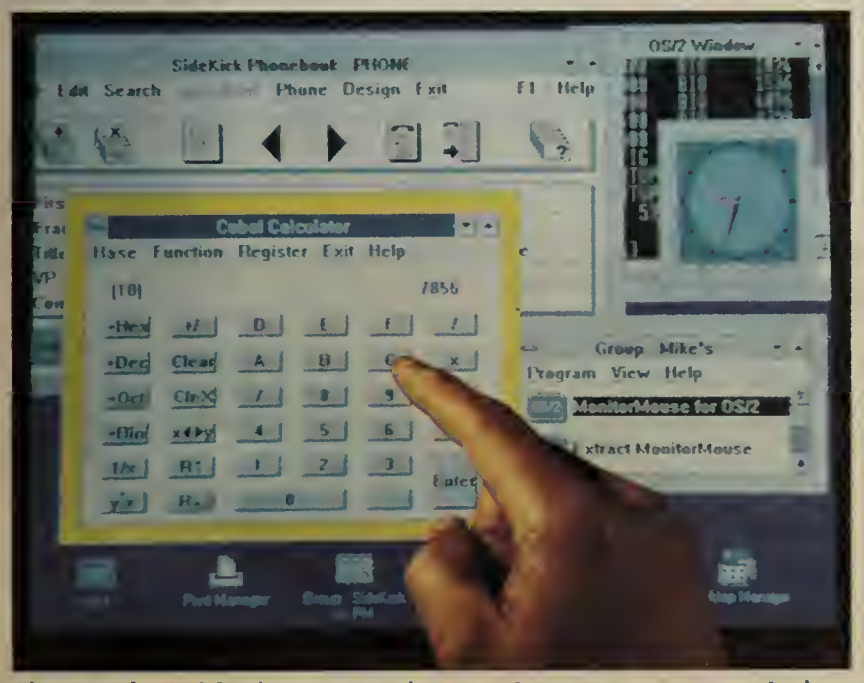
Macintosh products

A software package that emulates Digital Equipment Corp.'s VT320 terminals on Apple Computer, Inc. Macintosh computers has been announced by Walker Richer and Quinn, Inc.

Reflection 2 Plus for the Macintosh includes a proprietary error-checking file-transfer feature, an easy-to-use graphical user interface that conforms to Macintosh standards and the multitasking capabilities provided by Apple's Multifinder software.

The product requires a 512K-byte Macintosh Plus, SE, SE/30 or II. It is available immediately for $249.

Walker Richer and Quinn
2815 Eastlake Ave. East
Seattle, Wash. 98102
(206) 324-0350



Elographics *Monitormouse gives touch-screen mouse emulation*

Elographics, Inc. has introduced a software-based emulator designed to serve as a software driver for users of OS/2.

Monitormouse for OS/2 allows OS/2 programs to accept touch-screen input by emulating a mouse.

It is compatible with pro-

OS/2 software

A debugger for OS/2 systems has been announced by OS Technologies Corp.

The Universal Device Driver Debugger enables users to troubleshoot device drivers, installable file system drivers and other system software on versions of OS/2 such as 1.1, 1.2 Standard or Extended Edition. It features an asynchronous port and a terminal to debug input and output.

The debugger sells for $249.

OS Technologies
532 Longley Road
Groton, Mass. 01450
(508) 448-3650

Data storage

CPI Industries has announced the Valiant series of disk storage systems for IBM RT workstations.

The series of Winchester storage systems includes the Storage Module Drive and small computer systems interface disk interfaces. All models feature 15-msec minimum access times and disk data transfer rates up to 3M byte/sec. Disk capacities include 374M bytes (R-9003), 689M bytes (R-9006), 820M bytes (R-9008) and 1.1G bytes (R-9009).

The R-9000 models are priced from $5,900 to $14,900. Optional tower or rack-mount configurations are available.

CPI
Suite B-135
11879 Dublin Blvd.
Dublin, Calif. 94568
(415) 829-9462

Pinnacle Micro, Inc. has introduced a 3½-in. erasable optical disc drive that features a 28-msec seek time and 128M bytes of data storage capacity.

The REO-130 small computer systems interface device is available in internal and external versions with interface kits offered for Apple Computer, Inc. Macintosh, Sun Microsystems, Inc., Digital Equipment Corp., IBM and compatible systems.

The drive lists at $2,995, with each cartridge priced at $129. The product is slated to begin shipping in October.

Pinnacle
15265 Alton Pkwy.
Irvine, Calif. 92718
(800) 553-7070

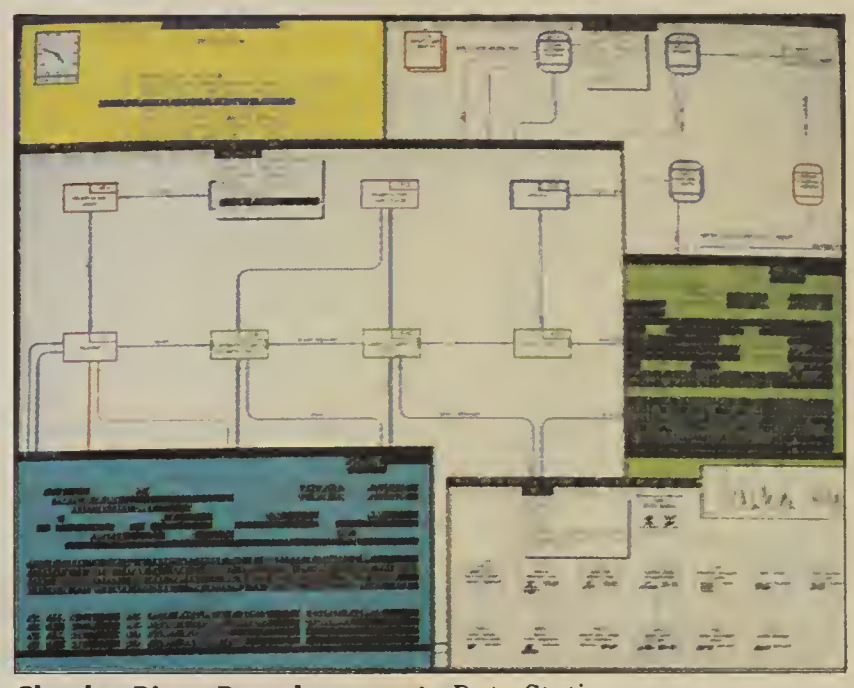
Peripherals

ACC Microelectronics Corp. has announced a single-chip controller designed for manufacturers of notebook-size Intel Corp. 80286- and 80386SX-based IBM Personal Computer AT-compatible systems.

The ACC-2036 chip integrates the logic and performance features of a 286- or 386SX-based system into a 208-pin package. The product supports 386SX microprocessors in pipeline mode at rates up to 25 MHz, and a standby mode allows the system to run as low as 1 MHz, the vendor said.

The chip lists at $100.

ACC Microelectronics
3295 Scott Blvd.
Santa Clara, Calif. 95954
(408) 980-0622



Charles River Development's *Data-Station*

Software applications packages

Charles River Development has introduced Version 2.0 of Data-Station for Sun Microsystems, Inc.'s client/server architecture for PC-DOS and OS/2.

Data-Station is a second-generation computer-aided software engineering tool and host/server dictionary that resides on a host or operates in a client/server mode to support project workstations.

Prices range from $13,400 to $100,000, depending on number of users.

Charles River Development
483 Beacon St.
Boston, Mass. 02135
(617) 424-1820

Minx Software, Inc. has introduced Minxware/RDB, an enterprisewide on-line transaction processing system for manufacturing companies.

The product is based on Minxware MRP II software and database software from Informix Software, Inc. It enables users of Unix workstations to use Informix's application development tools to create simple management reports, ad hoc queries or fully customized executive information systems, the vendor said.

Pricing ranges from $30,000 to $150,000, depending on number of users.

Minx
1762 Technology Drive
San Jose, Calif. 95110
(408) 453-6469

Ashlar, Inc. has announced Ashlar Vellum for Microsoft Corp.'s Windows Version 3.0, a computer-aided design package for Intel Corp. 80386-based personal computers.

Features include the Geometric Inference Engine, an interface technology that incorporates an expert system to create an interactive intelligent user interface.

Vellum runs on 386-based PCs running Windows 3.0 with 4M bytes of memory and a hard disk. It sells for $995.

Ashlar
1290 Oakmead Pkwy.
Sunnyvale, Calif. 94086
(408) 746-3900

Macola, Inc. has released a manufacturing package designed to interface with its accounting and distribution software products.

Standard Product Costing has been adapted to bring the capabilities of Digital Equipment Corp. VAX software into personal computer local-area network environments. The product maintains standard or estimated costs for manufacturing and accounting management.

The product runs on IBM PC ATs, XTs or compatibles with DOS 3.3 or higher. It is priced at $1,595.

Macola
P.O. Box 485
333 E. Center St.
Marion, Ohio 43301
(614) 382-5999

Development tools

Grid Systems Corp. and R2Z, Inc. have announced a software tool designed for use in developing graphical database applications on pen-based computers.

Padbase+ includes a pen interface that lets developers enhance database language applications compiled with Nantucket Software, Inc.'s Clipper database compiler.

The software runs on IBM Personal Computers or compatibles equipped with a mouse and a keyboard. It costs $450.

Grid Systems
47211 Lakeview Blvd.
Fremont, Calif. 94537
(415) 656-4700

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Newbury, Berkshire, UK RG13 2PZ
011-44-635-580000

COMMENTARY

Joanie M. Wexler

BOC blinders

If I were McDonald's, I'd be a little miffed if Burger King dropped by to borrow a pound or two of ground beef.

This is probably how the Bell operating companies (BOC) feel about the alternative local carriers hammering at their doors for equal access to the local public-switched network. After all, if I had spent a century building and honing my network, I wouldn't be too keen on some upstart strolling in with a pair of wires, hooking into my system and walking off with a chunk of my business.

But what if the alternative carriers are able to recognize demands that the Bell companies — in their complacent, monopolistic frame of mind — haven't gotten around to addressing? Could BOC myopia be limiting customer choices?

Customers are finding today's primary form of alternative local service — fiber metropolitan-area networks — particularly handy for disaster backup. Perhaps BOC customers could benefit if their carriers hooked into the metropolitan-area networks to provide that backup instead of spending millions to duplicate the effort and build

Continued on page 69

POS moves into networked PC era

BY ELLIS BOOKER
CW STAFF

CH-CHING. The sound of an old-fashioned cash register ringing up a sale has become a nostalgic bit of Americana. In yet another sign of the times, retailers are exchanging older mainframe- and minicomputer-based point-of-sale (POS) systems with networked personal computers.

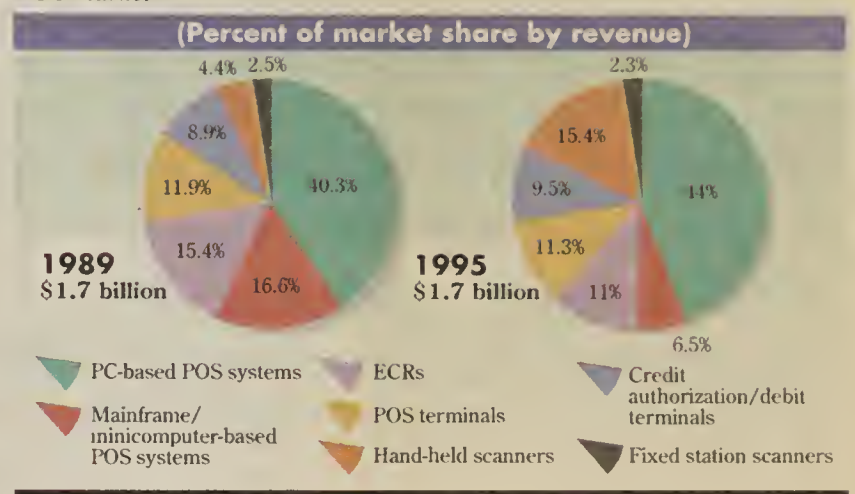
Cash registers — now often called POS terminals — have changed, too. Relatively inflexible electronic registers using proprietary software have given way to PC-based devices that feature large CRT screens, full keyboards and hard disks. Completing the puzzle, the communications links between these newfangled registers and the "in-store processor" are moving toward industry-standard local-area network protocols.

Market research firm Venture Development Corp., based in Natick, Mass., estimated that mainframe and minicomputer systems represented 16.6% of the $1.7 billion POS market last year but that this share will drop to just 6.5% by 1995. IBM held 35.6% of the $673.5 million PC-based POS market last year, followed by NCR Corp. with 23.6% and all other vendors with 27.4%.

Continued on page 72

PC takeover

Point-of-sale systems based on personal computer technology dominate the POS market



Source: Venture Development Corp. CW Chart: Paul Mock

Keep outsourcing control

Merrill Lynch holds tightly to MCI, IBM reins

BY ELISABETH HORWITT
CW STAFF

NEW YORK — Having backed away earlier this year from a $50 million agreement to outsource its network management to MCI Communications Corp. and IBM, Merrill Lynch & Co. is attempting to have its outsourcing cake and eat it too; or, to put it another way, to enjoy the benefits of outsourcing without having to entrust the management of its network entirely to vendors.

Merrill Lynch is accomplishing this through what might be described as a modified outsourcing relationship with MCI, under a $150 million contract signed a year ago. Merrill Lynch handed over much of its long-distance operations to MCI, but maintains an internal staff and IBM Netview system to manage the logical side of its network and to look over the carrier's shoulder and provide input, according to Thomas Byrnes, the firm's vice-president of telecommunications services.

Close interaction has been fostered by physical proximity. During the year-long effort to convert Merrill Lynch's 500 sites to MCI, some 70 MCI people worked on Merrill Lynch's premises, according to Robert Rouse, MCI vice-president of the Merrill Lynch implementation. About 40 MCI people remain at Merrill Lynch to take care of day-to-day operations, he said.

A similar arrangement was made for IBM staff members who work with Merrill Lynch on its IBM systems, according to Leonard Accardo, group manager of information processing at Merrill Lynch's West Street data center.

At a recent meeting with MCI, Merrill Lynch networking and systems executives discussed how they could obtain more direct access to network statistics and other data, partly by tying the Netview system to MCI's network control center, Byrnes said.

In addition, Merrill Lynch is trying to minimize the need for human intervention by commissioning IBM to develop programs that will automatically correlate network alerts, use expert systems to pinpoint the likely source of problems, and respond, Accardo said.

"The network is very complex, and it's impossible for a human to look at all of the connections," he added.

Automated network management is just one of several capabilities that Merrill Lynch hopes to obtain through its modified outsourcing agreements with MCI and IBM. The investment firm's overall strategy, Byrnes said, is to leverage its close ties with the two vendors in order gain the advanced functions it needs, without going through a costly internal development process.

Merrill Lynch is also discussing with MCI the implementation of virtual data networking and Integrated Services Digital Networking services that the carrier has yet to officially announce.

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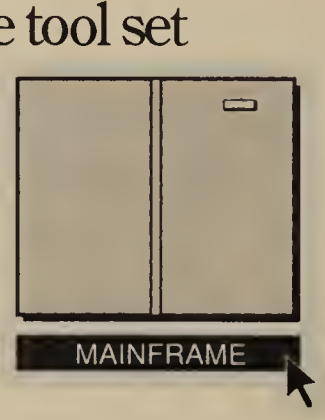
And with a unique Mac-to-host software tool set known as Mac-Workstation,® developers can create friendly front-ends to host applications that allow these applications to continue to evolve without modification of desktop software.



Not only does Macintosh connect into all environments, but Apple's Data Access Language makes it possible for your users to request and update information from host databases—regardless of what type of network technology, host system architecture, or DBMS they are using.

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*PC WEEK, May 7, 1990. **Direct LocalTalk connections dependent on NetWare 386 NLM due Fall, 1990. Macintosh connection achieved today via standard bridges.

DEC to bring Athena from MIT

BY ELISABETH HORWITT
CW STAFF

BOSTON — There is now hope for universities and corporations that have been wishing in vain for a distributed workstation management system just like MIT's Project Athena. Digital Equipment Corp. has been quietly implementing a commercial version of Athena at selected beta-test sites and is now making its products and services commercially available, the company has announced.

Better still, at least a couple of DEC's rivals reportedly have said they will work to implement Athena on their own systems for customers on a case-by-case basis.

Initiated in 1983 and operational since 1988, Project Athena is a joint IBM/DEC effort to design a distributed desktop system that would "improve the quality of education on the MIT campus," DEC marketing manager Barry Braunstein said. Proof of the system's management prowess is that it now supports more than 10,000 user accounts on more than 1,000 workstations, providing services to 90% of the undergraduates and 50% of the graduate students at MIT, Braunstein said. The system and network is managed by a staff of six, he added.

Among the capabilities that the vendors worked to incorporate into the system were support of up to 10,000 workstations, easy access to resources distributed across multiple networked servers, "time-share-quality security" and minimization of costs related to management, maintenance and operation.

Project Athena also sought to keep users' options open regarding the workstations they could choose. Athena is based on industry or de facto standards such as Unix and Transmission Control Protocol/Internet Protocol. The project also generated protocols that the industry has since adopted as standards, such as X Window System and the Kerberos security system.

Proof that Kerberos has fangs: On a campus famous for its computer wizardry, there have been no successful system break-ins.

North Carolina State University's engineering school is one of the sites at which DEC is implementing an Athena system. The sixth largest engineering college in the country, the school has been developing a plan to provide computer resources to students more effectively for the last five or six years, said William Willis, the college's director of computer operations. "When you have 7,300 students, this is nontrivial," he said.

The college evaluated a number of other workstation systems that required "installing a new cluster" and assigning an additional person to manage that cluster "once you got past 30 to 50 workstations," Willis said. "That's not affordable for us."

With Athena, the college found what it wanted: Software to run large distributed networks of computers so that they "looked like a single computer system" and could be managed by a minimal number of people, Willis said. Students can "walk up to any workstation on the network and get to their own files and applications," he added.

The college now has most Athena components up and running, Willis said. DEC's role of tailoring the system to the college's needs has proven critical, he added, because Athena "is not a finished product yet, and there are a lot of MIT-isms in there that don't necessarily apply to us." The school does not intend for its Athena network to be all DEC and has received assurances from Data General Corp. and Sun Microsystems, Inc. that they will "commit resources to porting Athena to their systems, although they didn't say they would sell it to the world," Willis said.

While DEC is targeting its Athena offerings at universities, several businesses have also expressed interest in the system, Braunstein said. In particular, large companies in the aerospace, electronics and chemical industries that "have many workstations and are wondering how to manage them" are strong candidates for Athena, he added.

Network of gods

The sponsors of Project Athena developed a series of modules for managing a distributed workstation environment and named them after various personae from Greek mythology and history. The cast of characters, which DEC plans to move out of MIT and into the public market, includes the following:

- Hesiod (the poet) keeps track of resources and translates a request for a logical destination to a physical location.
- Kerberos (the hound that guards the gates of Hades) prevents unauthorized users from making use of the system and is specially designed to provide security in an environment where many people may be using the same workstation.
- Zephyr (the god of wind) provides messaging services such as club notices, on-line conferences, bulletin boards and systems support notifications. Zephyr also controls access to printer services, keeping track of the number of pages each user prints for accounting purposes.
- Moira (the goddess of fate) is the master database and shell.

ELISABETH HORWITT

Wexler

FROM PAGE 65

their own fiber networks.

Other competitive customer benefits may include the ability to switch traffic off non-Bell metropolitan-area networks into the long-distance network through the BOC central office. This is currently not happening much because the BOCs already bundle that switched access charge with local transport and switching charges. The alternative carriers maintain that this puts them at a cost disadvantage in supplying any one of those services, because the customer will be duplicating his payment in the Bell bundle.

Switched access to the long-distance network is also an issue because the BOCs are understandably reluctant to collocate competitors' equipment in their central offices and aren't racing to provide an equal quality of interconnection service. Alternative carrier Teleport Communications Group has successfully negotiated interconnections in New York and New Jersey, but the alternative carriers are having to tackle each local BOC and state public utility commission on a case-by-case basis to get the interconnection quality they feel they deserve.

The BOCs are struggling with the dilemma that all computer and networking vendors are facing in an era that has customers hollering for interoperability and ubiquitous connectivity: striking a delicate balance of competition and cooperation. Somehow, vendors must make their products and services more attractive by providing interoperability with competitors' offerings while minimizing the sales dollars forked over to the other guy in the process.

It's a mind-boggling task — and it leaves users floundering amid the politicking and game-playing that goes on as vendors weigh their vested interests against customer demand.

Competition in the local loop is a complex issue that is not going to be easily resolved. The alternative carriers want to compete on a level playing field. But how much competition or regulation is needed in the local loop to keep the local carriers honest and responsive to customer needs? Do we need Divestiture II at the local level?

The seven BOCs complain that they're already collectively losing about $4 billion per year to "bypass" activity. This figure, however, includes bypass methods provided by the BOCs themselves — such as dedicated T1 links — and applications that were never intended to run through the BOC central office anyway, such as local-area networks.

Alternative carrier Metropolitan Fiber Systems moans that BOC competitors are able to vie for less than 1% of the $25 billion local telephone service market because of the BOCs' lack of cooperation. That doesn't sound a whole lot like competition — but then, how many wires do you need in the street going to the same place?

The BOCs do seem to want to have their cake and eat it, too. They want to enjoy the fruits of their monopoly status — who wouldn't? — but they continue to hound U.S. District Judge Harold H. Greene to let them get into other areas of business, such as manufacturing, long-distance and voice mail services. In short, they want to be deregulated without paying the price.

Perhaps they should pick a priority: Either cling to their monopoly or let up on the alternative carriers and gain some deregulatory ammo for getting permission to expand into new businesses.

Wexler is a *Computerworld* senior writer.

BIT BLAST

IMC Networks fires latest shot in Ethernet price war

IMC Networks Corp. has entered the Ethernet network adapter card price war by lowering the cost of its Ethernic 8-bit card to $199. The price war was kicked off in May when **Western Digital Corp.** started shipping its 8- and 16-bit Ethernet cards for $249.

BT Tymnet, Inc. said last week that its Tymnet value-added network now provides menu-driven access to more than 850 databases available from 13 worldwide information providers. The vendor said the service triples the information sources accessible to BT Tymnet customers.

Codenoll Technology Corp. has reportedly contracted with **General Motors Corp.'s Packard Electric Division** for the manufacture of Codenoll's fiber Ethernet local-area networks. Codenoll Technology said it expects to transfer the manufacture of its Fiber Distributed Data Interface LAN products to the GM division in the near future.

Polaroid Corp. has announced an agreement with **Nynex Corp.** under which Polaroid will resell Compaq Computer Corp.-based LANs to users of Polaroid's ID-2000 Digital Security and Identification System, and Nynex will install and service the LANs.

Unix server vendor **Auspex Systems, Inc.** recently announced that it has raised $12 million in equity investments and licensing fees from **Fuji Xerox Co. Ltd.** and **Nissho Electronics Corp. of Japan.**

Olicom USA said it retested its 4M and 16M bit/sec. token-ring network adapter cards after the recent **Madge Networks Ltd.** announcement that a faulty Texas Instruments, Inc. chip caused Madge to recall 2,000 boards. Olicom reported that its boards, which also use the TI Falcon chip, still work fine and are running in networks as large as 120 nodes.

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And it's ready just when you need it the most.

Today.

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Software superior by design.

POS

FROM PAGE 65

One advantage of standard networking and computer platforms is that it makes it easier to combine systems — a necessity in a retail marketplace marked by mergers and acquisitions, according to Steve Johnson, a partner at Andersen Consulting in Chicago.

"The most important trend has been the replacement of proprietary with industry-standard networking," Johnson said. Open architectures not only make "hardware a commodity," he said, they also make a wider array of technologies available to the store.

For example, stores can decide to employ commercial database software or move to more exotic POS concepts, such as the use of handheld, order-entry terminals — connected to the store's POS server over a radio frequency network — that roving salespeople can carry throughout the store to do inventory updates or actually process a customer sale.

Giant retailer JC Penney Co., for example, is revamping its POS system, replacing older checkout terminals and back-office servers at each of its 1,300-plus retail locations nationwide.

Dennis Teubner, manager of store systems support at the company's Dallas headquarters, said the back-room processors had run out of capacity for processing power and disk space, and that "maintenance was becoming a nightmare" when it came to the 10- to 15-year-old POS terminals. On average, each store has 55 registers.

In May, JC Penney announced it had selected NCR for the $45 million POS contract, which includes purchasing over 16,400 of NCR's top-of-the-line POS terminal, the NCR 7052. The 7052 features a complete alphanumeric keyboard, a specialized POS keypad and a 9-in. CRT, and it uses an Intel Corp. 80286 microprocessor.

The terminals are networked over an AT&T Starlan, then routed to PC-based concentrators, which do a protocol conversion to a token-ring network protocol. The token-ring concentrators and the Starlan were necessary, Teubner said, to get past the distance limitation of a token-ring.

Unlike a number of retailers who use a single in-store processor, JC Penney has opted to use two servers per store: one to handle administrative back-office functions and another containing the inventory price database.

This POS processor also acts as a communications gateway for credit authorizations and for connection to one of the chain's three national data centers. Both servers use NCR PCs.

Teubner said he considered Unix networking for the store networks but that "in the multitasking world of token-ring, if you want to expand, you can add another processor . . . and personally I think you can test new applications easier than this in a Unix configuration."

In addition, the NCR 7052 POS terminals include integrated magnetic stripe readers for credit cards and the ability to use bar-code scanners.

Previously, the retailer used OCR-A tags on its merchandise, but the scanning gave only a 50% read rate, according to Teubner. He said the bar-code readers should result in a 98% to 99% accuracy rate.

Teubner also said the fully programmable features of the terminals will make them easier for salespeople to use and that work will start soon on improving what he called the registers' "presentation services."

"Our long-term plan," he concluded, "is to push the interactive query down to the register level."

The deployment of JC Penney's new terminals and servers, begun last year, will be half done by the end of 1990 and finished next year, Teubner said.

Tools of trade

Taking full advantage of the personal computers at the core of their POS systems, some retailers have chosen to use commercial PC software as the basis of their homegrown applications.

Phar-More, Inc. in Youngstown, Ohio, for example, uses a fourth-generation database program from Informix Software, Inc. in Menlo Park, Calif., for its inventory management, videotape rental tracking and register system interface.

"There weren't systems to do the things we needed that we could buy over the shelf," said James Blake, Unix systems programming manager.

The 3-year-old applications, written by Blake's small programming staff, reside on in-store processors — an NCR Tower running Unix — in each of Phar-More's 200 outlets in 19 states.

AIAG drives closer to EDI standardization

BY ALAN J. RYAN
CW STAFF

SOUTHFIELD, Mich. — They may never agree on who makes the best cars, but Automotive Industry Action Group (AIAG) members recently agreed to make the necessary compromises to standardize often used electronic data interchange (EDI) transaction sets in their industry.

EDI specialists from 28 participating companies — including General Motors Corp., Ford Motor Co., Chrysler Corp., Deere & Co., Caterpillar, Inc., TRW, Inc., Allied-Signal, Inc. and 17 truck manufacturers and key suppliers — have been working to come up with ways to bring order to the automotive industry's EDI chaos since early this year.

The AIAG estimated that there are 20,000 suppliers that furnish production parts to the auto industry, and at least 80% to 90% of them are doing some level of EDI with their customers, according to John C. Martin, AIAG managing director.

By eliminating repetitious clerical operations and being able to transmit standardized computer-readable data, auto industry manufacturers and suppliers said they can trim significant "non-value-added" costs from each vehicle.

The auto industry has been moving to EDI — reportedly investing hundreds of millions of dollars in it — since the 1970s, and volume buyers of automotive materials and parts have developed their own EDI methods and imposed them on suppliers. Suppliers have often had to bear the cost of maintaining several different EDI computer systems, according to Michael Gerus, AIAG project team coordinator.

Chrysler and Ford eliminated their proprietary systems in the mid- to late 1980s, and General Motors is moving in that direction. However, there are many variations of the ANSI X12 standards that still create problems for the suppliers, according to Gerus.

Ongoing efforts

Early this year, the AIAG assembled 100 EDI specialists from member companies to discuss the problem. The proposed solution was to standardize EDI systems.

Many AIAG companies believe the entire industry should use standard transaction sets, the specific formatting codes for purchase orders, shipping notices, receipts, invoices, payments and other electronic transactions, according to Martin.

Gathering the member companies was the easy part, Martin said, but "the first meetings bordered on civil war." Agreement was reached on the first two transaction sets and progress accelerated. By the end of the year, the AIAG said, it expects to have published implementation guidelines for 17 high-use transaction sets.

Martin said the difficulty in standardizing is defining the information and terminology to be used. "Over the years, each company has established its own business practices and culture," and changing company culture is not easy, he said.

NEW PRODUCTS

Local-area networking hardware

Integrated Network Corp. has announced a shelf-mounted CSU/DSU system for use in high-density switched and dedicated digital data applications.

The CM-1000 includes a standard VME shelf that can support up to 21 CSU/DSU cards. It also provides dedicated digital service (DDS) CSU/DSU cards equipped with RS-232D and V.35 interfaces to support maximum DDS speeds of 56K bit/sec., the vendor said.

The system is scheduled to be available this month for a list price of $1,175. Switched service CSU/DSU cards are slated for a first-quarter 1991 release. Each DDS CSU/DSU card will cost $850.

Integrated Network
757 Route 202/206
Bridgewater, N.J. 08807
(201) 218-1600

Gateway Communications, Inc. has introduced an unshielded twisted-pair Ethernet local-area network adapter.

The G/Ether-Twist MC adapter was designed to provide efficient data transfer between Micro Channel Architecture-based IBM Personal System/2s and compatibles and an Ethernet LAN.

The product also features 64K bytes of extended on-board memory, drivers for several operating systems and support for Transmission Control Protocol/Internet Protocol, according to the vendor.

The suggested retail price is $460.

Gateway Communications
2941 Alton Ave.
Irvine, Calif. 92714
(714) 553-1555

Local-area networking software

AGE has announced a server that enables IBM Xstation Model 120 terminals to operate with Digital Equipment Corp.'s Decstations running Ultrix.

Xoftware Manager/DEC provides Ultrix users with features of the Xstation 120, including dynamic display configuration and serial and parallel device attachments.

All connections are via Ethernet and Transmission Control Protocol/Internet Protocol interfaces.

A Xoftware Manager/DEC binary host costs $625 for single-user and $995 for multiple-user Xstation licenses. It is scheduled to be available in the second quarter.

AGE
8765 Aero Drive
San Diego, Calif. 92123
(619) 565-7373

Mt. Xinu has announced K-A-Share, a software package designed to convert a Sun Microsystems, Inc. workstation into an Apple Computer, Inc. Appleshare file server.

The product fully implements Apple's Apple Filing Protocol for sharing files among networked Macintosh machines. K-A-Share puts the Appleshare host software in the background of a Sun workstation instead of in a dedicated Macintosh machine, thereby enabling each Macintosh system to be used as a complete personal computer. Each copy of the package can support up to 100 Macintosh systems.

Prices begin at $995.

Mt. Xinu
2560 Ninth St.
Berkeley, Calif. 94710
(415) 644-0146

Datability Software Systems, Inc. introduced a software program that converts IBM Personal Computer ports into terminal server ports to form a PC-based communications server.

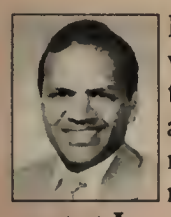
Vistaware can reportedly convert any IBM PC or compatible, Personal System/2 or Digital Equipment Corp. Vaxmate system into a high-end dual-protocol local access and transport area and Transmission Control Protocol/Internet Protocol Telnet terminal server.

The product is priced at $695.

Datability Software Systems
322 Eighth Ave.
New York, N.Y. 10001
(212) 807-7800

MANAGER'S JOURNAL

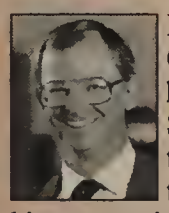
EXECUTIVE TRACK



Raj Gupta was named to the newly created post of director of information management at **Leo Burnett Co.** in Chicago. He will oversee both the Chicago headquarters and the worldwide information operations at Burnett, which is one of the largest advertising agencies in the world.

Gupta has been at Burnett since 1975, starting as a program analyst in the information services department and then switching to the advertising side of the business, where he worked his way up to account director.

Gupta, 41, holds a bachelor's degree from Louisiana State University, a master's degree from Duke University and a Ph.D. in applied mathematics and electrical engineering from Duke.



First Trust Corp. in Denver has named **Don Skender** director of information services. In his new position, he will oversee the company's computer programming, word processing and computer operations.

Prior to joining First Trust, which specializes in the trusteeship and administration of self-directed individual and business retirement plans, Skender was the manager of information services at a subsidiary of Pulte Home Corp. in Houston.

Skender is a graduate of Austin College and received an MBA from the University of Denver.

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Rocketing past political barriers

BY MAURA J. HARRINGTON
CW STAFF

Najlah Feanny

NASA's Erickson *envisions expanded implementation of user interface*

Even on a hot, humid Houston summer day, not a bead of sweat can be found on Lloyd Erickson's face as he strolls calmly about the National Aeronautics and Space Administration's grounds, admiring the enormous rockets on display at the Johnson Space Center (JSC).

"There's something about working here that gives me a special feeling . . . a feeling of being a part of history that makes me feel good," says Erickson, who has been working at the JSC — the U.S. space center for manned operations — for the past 25 years.

Erickson's job does not deal with training astronauts how to live in space, but like the astronauts at the JSC, Erickson spends a good portion of his time trying to communicate with JSC employees here on Earth.

A bit of a salesman

Erickson, an elegant southwesterner who is always willing to tell a tale, was not shy about saying that he has "just enough salesman" in him to convince upper management, his peers and other employees at JSC how they can benefit from the use of his newest project, called the Johnson Space Center Management Information Systems (JSCMIS). JSCMIS is a common interface designed for users to access multiple databases seamlessly through the use of IBM's Professional Office System (Profs) electronic mail system.

Although, technically, Erickson's title — electronics engineer for the data processing systems division, Mission Support Directorate at the JSC — doesn't make him an IS manager, he claims that two years on the JSCMIS project has taught him a great deal about being one.

Erickson conceptualized, designed and sold the idea for JSCMIS to upper management. He is also project leader and NASA Technical Monitor for JSCMIS and was responsible for finding the outside contractors for the systems development and research help from the University of Houston-Clear Lake. These are all tasks an IS manager would normally perform, he says.

The JSCMIS program has received favorable reviews from its users, who total about 100 so far, according to Peter Bishop, associate professor and director of the University of Houston-Clear Lake's Space Business Research Center.

"We think we've put ourselves in touch with the people who are using the system," says Bishop, who helped with the project.

However, it has not been easy to win such approval, Erickson says.

"When I told people I was going to build a common interface for access to multiple databases and make it accessible through Profs, people told me I was crazy," he says. Upper management "didn't want to chance anyone doing anything with the system because they were afraid this project might bring the system to its knees."

So far, nothing of the sort has happened, Erickson says. Precautions are being taken so that as JSCMIS becomes available to more users, the system will be protected from a crash.

Ideally, Erickson says he would like to implement his JSCMIS program throughout the entire center, embedding the concepts of JSCMIS into the system to become a JSC standard. But although this goal is feasible technologically, politics and the management structure of the JSC have slowed up the project's success so far, Erickson says.

For each JSC software application,

Continued on page 79

Telecom managers gaining increased stature

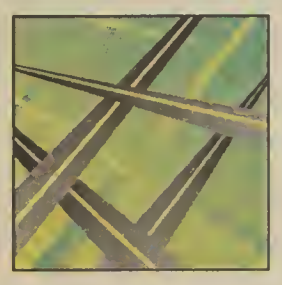
BY ALAN J. RYAN
CW STAFF

Managers of information systems, take note: With more telecommunications managers taking responsibility for the integration and operation of both wide-area and local-area networks, they are being elevated to a position equal with IS managers.

According to Arthur D. Little, Inc. senior consultants Michael D. Kennedy and David Rubin, the rise of corporate networking has moved telecommunications from a reactive administrative function into a vital, active operating position that can substantially affect a company's competitiveness and bottom line.

The consultants, writing in an issue of *Spectrum*, published by Arthur D. Little's Decision Resources affiliate, said the new role for telecommunications managers carries an increased responsibility to take an active, visible role in corporate decision-making.

The most effective telecommunications managers will be aggressive innovators who work with unit managers to find productive ways to exploit advances in networking, they said.



The key to using telecommunications to competitive advantage, the consultants added, is to be certain that the company's networks are as good or better than those of the competition.

To be sure the company remains competitive, the authors suggested that managers classify telecommunications systems into three categories — base, key and pacing — and compare the mix to that of the competition.

The authors said a lot of base technologies indicates a lack of competitive advantage; an emphasis on key technologies suggests that the telecommunications technologies are helping to make the company more competitive, but moving too fast into unproven technologies is not an advantage.

The authors further suggested that managers keep the telecommunications infrastructure costs below the industry average. For example, purchase bulk transmission capacity, which can save 10% to 15% of transmission service costs, and replace obsolete telephone systems, which can save 10% to 20% of telephone system costs.

CLIPS

Tim Lewis

Summaries from leading scientific and management journals

"Requirements for the next generation of DBMS"

By Gordon C. Everest

University of Minnesota Management Information Systems Research Center Working paper

■ Networked database management systems and relational DBMS fall short for future computing requirements. There are three areas driving the search for a new generation of DBMS: They must support the data management needs of computer-aided design and manufacturing and graphics applications, they must operate in an open distributed environment, and they must capture more complete semantics of a data structure.

Some of the principles of object-oriented programming show promise in the development of a database structure to meet those requirements. Object-oriented DBMS include the following notions:

- **Object identity.** The ability to distinguish objects regardless of their characteristics or location and to facilitate object sharing.
- **Object typing.** The ability to define new object types and associate objects with one or more object types.
- **Object assembly.** The ability to create arbitrarily complex and dynamic objects from other objects.
- **Inheritance.** The ability to define subtypes and supertypes so that subtypes inherit attributes of their supertypes.
- **Encapsulation.** The ability to define operations associated with an object type.

However, object-oriented DBMSs don't meet all needs for the future. DBMSs must also offer an interface that can manipulate objects in time and space.

"Planning and building strategic information systems"

By John Burch

Journal of Systems Management July 1990

■ The following are steps to developing a strategic information systems plan:

- Establish IS goals. This step involves the review of company operations, system policies and business plans. There should be a lot of IS and user interaction. The aim is to align business and IS objectives. The idea is to solicit system project ideas from the business and IS side, as well as from outside consultants. Reviewing documentation such as previous systems plans and important memos can help in reaching an IS goal.

This investigative process should help IS to design and implement systems that support the organization's goals, to exploit business opportunities and to follow a systems development methodology that takes users into account and provides status and progress on all new systems projects.

- Elicit and prioritize IS project requests. IS can formulate a method to prioritize system requests. This entails filling out a systems project request form, preparing a systems project request priority worksheet and plotting a systems priority request grid. Requests should be judged on strategic and feasibility criteria. The planning team must judge how well each request is linked to the goals of increasing productivity, enhancing products and service and improving management decision-making.
- Assess IS resources and capacity. IS needs to make sure it has the resources to support current operating needs and take on new projects.

"Legal protection of information"

By Jeffrey A. Meldman

Sloan School of Management Center for Information Systems Research Working paper (May 1990)

■ As information becomes more important and relied on more often for business and personal use, concerns over its protection and privacy are cropping up. Legal protection of information finds its foundation in doctrines that have long protected people and their property. Legal protection from computer crime, from patent and copyright infringement and from theft of trade secrets are protections that treat information as intellectual property.

Protection of information as intellectual property can be done through copyright, trade secret and patent. Computer software falls into this category. Copyrights and trade secrets are the most popular forms of protection for software, because they are cheaper and faster to obtain than patents. A plus is that the courts have consistently upheld the applicability of copyright and trade-secret law to software.

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COMMENTARY

Alan J. Ryan

Paying homage to the humble ant

In an ant colony, the big old queen finds a nice safe spot, kicks off her slippers, lays some eggs and is doted on by a few loyal males. Hers is a full-time job that ensures a future supply of workers for the colony.

Meanwhile, throngs of worker ants dig tunnels, move eggs from one chamber to another, venture outside to forage for food, try to avoid a host of calamities and basically keep the business of running an ant colony on track.

I don't pretend to fully understand the intricacies of ant colony life, but I suspect that old Queenie is not spending a lot of time thinking about her workers. It's even more doubtful she will recognize for bravery those ants who manage to outrun a can of Raid or sidestep a fast-approaching Converse All Star.

Fortunately, life for human workers can be more rewarding — if the queen, king, chief executive officer or some other top official wants to make it that way.

Anyone who has ever worked for a small company has seen it in action: The boss simply steps out of his or her office to pat the worker on the back (or some other ingratiating gesture) for a job well done. The employee beams, the boss exits, and everyone is pretty happy.

But in large firms, it gets trickier to honor good work beyond the local level; it takes a crafty executive to keep on top of the events that merit a pat on the back.

It can be done, however, even if the pat is not a physical one.

For instance, at Connecticut Mutual Life Insurance in Hartford, the chairman is tapped into an executive information system (EIS) that allows him to call up a file that lists "mega-achievers." The mega-achievers — those enterprising insurance salespeople who have sold major policies worth $1 million or more in the last day — then get personalized recognition for their efforts.

IN LARGE FIRMS, it gets trickier to honor good work beyond the local level; it takes a crafty executive to keep on top of the events that merit a pat on the back.

The EIS mega-achiever listing includes the salesperson's name, office and phone number. The chairman can simply touch his screen; the number is dialed, and the congratulations are doled out.

If the call is placed but the deserving salesperson is not in, the executive can then send himself an electronic note that will pop up on his screen later in the day to remind him to try again.

Theoretically, the chairman could find out about the sale of the policy within minutes of the client signing the paperwork, and within minutes, he could have that salesperson on the phone — no matter where the salesperson is located.

Some will argue that the executive is taking an easy way out by having his computer alert him to big events. I disagree. They'll say that using a computer to track accomplishments is impersonal. And I'll say that argument is rubbish. After all, it is better to use a computer to track accomplishments than to recognize an important event weeks or months after it happens, or worse, not recognize it at all.

Connecticut Mutual's chairman is willing to spend the time and make the effort to follow what the employees are doing. And top executives at many companies have their own methods of doing the same thing — some write personal letters or send notes for a job well done. That there is a computer system that helps to make the effort timely and effective is an added bonus.

The outcome is the same: The worker feels good about his or her job and is pleased someone at the top took time to notice; the top executives feel good about their employees and show it; and the ants — well, be glad you're not an ant.

Ryan is a *Computerworld* senior writer.

MANAGEMENT BRIEFS

AMS seeking nominations for exec awards

American Management Systems, Inc. and the Graduate School of Industrial Administration at **Carnegie Mellon University** have announced that they are currently seeking nominations for the Fourth Awards for Achievement in Managing Information Technology.

The awards — which were launched in 1987 — are given to executives and professionals from the nation's leading organizations who have made outstanding contributions to their organizations through the effective use of computer and communications technology.

Nominations for the awards can be made by chief executive officers or other top executives of the participating organizations.

Nominations must be submitted before Aug. 15, and a first-level screening of the nominations will be completed by Oct. 31.

Finalists will be selected by Jan. 31, 1991, and the awards will be conferred in May 1991 at an awards ceremony in New York.

For more information, contact Jan Dodson, American Management Systems, Arlington, Va. (703) 841-5830.

NASA

CONTINUED FROM PAGE 73

there is one manager responsible for making the application run smoothly. While this system helps keep the software up to date and running, it means that fingers can always be pointed if something goes wrong. That makes it more difficult for Erickson to convince these people that their software will not become any more vulnerable — as some fear — if it is on the JSCMIS system.

"The problem with implementing all products to this system is political and organizational — not technical. We in technology think that all you have to do is create a technology path and it will automatically flow, but that's not always true when political issues are involved," Bishop says.

> "WE DESIGNED it for the occasional user, not for the engineer-type user."
>
> LLOYD ERICKSON
> JOHNSON SPACE CENTER

However, Erickson is convinced that sooner or later more managers will want to have their application software on JSCMIS.

Presently, JSCMIS includes electronic access to the JSC's personnel system, which includes personnel statistics, registration information and financial — plan vs. actual cost — information. Erickson is also close to making the center's travel program accessible on JSCMIS, he says.

The program allows the user to access the necessary data without having to log in and out of various databases, even when the information desired is on more than one database. This is possible through the use of Nomad, a fourth-generation language from Must Software International that co-exists with Profs on an Amdahl Corp. 5890 Model 300 mainframe, Erickson says.

"Rather than have the user do a complete mind switch, we say let's just map these [Nomad keys] to be the same as the system they were just on" in Profs, he says.

It isn't a matter of technology, but of making a system that is easy to use and easy to access, with a user-friendly pick-and-choose environment, Erickson says. "When we designed this system we designed it for the occasional user, not for the engineer-type user."

The occasional user at the JSC is defined as any employee who needs to access data from multiple databases, but who uses the computer as a tool, not as a primary focus of activity.

Erickson says he is confident about eventually making the JSCMIS program a painless way for users throughout the JSC to access the data they need from multiple databases. "It's the most exciting project I've worked on here to date," he says.

Singing an IS song

Although Lloyd Erickson is a singer and bears a resemblance to Kenny Rogers, country music is not his bag. In his spare time, Erickson sings with a barbershop quartet that goes by the name "Deuces Wild."

However, Erickson — the singer/engineer and JSCMIS project leader — isn't always humming it up with the boys.

Lately, in his spare moments, Erickson has been reminiscing about the times when there wasn't always so much to sing about.

"This [JSCMIS] project was successful, I think, because of lessons learned from a similar project I worked on that failed," Erickson says. That was going to be a system for the center's budget that would have allowed users to access information in multiple databases via one main interface.

Confused users

"But the reason why [the project] failed is that we didn't give the users what they really wanted," he says. "The underlying data coming out of the accounting system wasn't really mature enough to be shown to people electronically," which means that users who beta tested the system were too confused when looking at the data in the manner in which it was presented.

"The accountants would have to hand-massage the data that came out of the computers before they showed it to anybody, because they knew that there were certain attributes in the system that were not representing reality," he explains.

"Once we gained electronic access we said, 'Whoa! We can't let people see this, the system's not right,' " Erickson adds, so he and his colleagues canned the project.

However, with the advent of relational databases, spreadsheets and windowing technology, Erickson said his new project, JSCMIS, could only be blocked by upper management, because the technology was there.

"I knew that with a little bit of support from management I would be able to build something that would be truly useful. Luckily, I had just enough salesman in me that I was able to convince the appropriate levels of management that this was a worthy risk. And the payoff has been enormous," Erickson says.

MAURA J. HARRINGTON

CALENDAR

The Japanese concept of total quality management is making inroads in U.S. corporations, and information systems often play a vital role in the process.

"Customer-Driven Quality: Detailed Case Studies from Leading Manufacturers Successfully Utilizing Their Customers to Drive Quality Throughout the Organization" will be the theme of a Sept. 25-26 conference in Chicago.

The conference, sponsored by The Manufacturing Institute, a division of the Institute for International Research, will provide case histories to reveal what some large companies, including 3M Corp. and General Motors Corp., are doing in the area of the customer-driven quality process and the impact it has had on each business.

For more information, contact the Institute for International Research, Inc., New York, N.Y. (212) 826-1260.

JULY 29-AUG. 1

Mid-Atlantic Storage Management Association Forum. Philadelphia, Aug. 1 — Contact: Randall Lebedz, MASMA, P.O. Box 391, Manville, N.J. (201) 526-9325.

Computer Security in the '90s Conference and Expasition. Atlanta, Aug. 1-3 — Contact: Inforum, Atlanta, Ga. (800) 343-5048.

Object-Oriented Design and Pragramming seminar. Montreal, Aug. 2-3 — Contact: Darcy Harrison, Interactive Software Engineering, Goleta, Calif. (805) 685-1006.

AUG. 5-11

Unifarum Open Systems Seminar. Chicago, Aug. 6 — Contact: Uniforum, Santa Clara, Calif. (408) 986-8840.

Managing infarmatian Resaurces in the '90s: A Fresh Start. Princeton, N.J., Aug. 6-9 — Contact: Louise Spieler, National Association of State Information Resource Executives, c/o Council of State Governments, Lexington, Ky. (606) 231-1870.

Narth American iSDN Users' Farum. Gaithersburg, Md., Aug. 6-9 — Contact: Lori Phillips, NIST, Gaithersburg, Md. (301) 975-2937.

Siggraph '90. Dallas, Aug. 6-10 — Contact: Siggraph '90, Chicago, Ill. (312) 644-6610.

intraductian ta AiX System Administratian. Toronto, Aug. 8-10 — Contact: Bragen Group, Toronto, Ontario (416) 366-6363.

AUG. 12-18

The Urban and Regianai infarmatian Systems Assaciatian. Edmonton, Alta., Aug. 12-16 — Contact: URISA, Washington, D.C. (202) 289-1685.

SHARE 75. New Orleans, Aug. 12-17 — Contact: SHARE headquarters, Chicago, Ill. (312) 644-6610.

Dawnsizing Conference: Maving fram Mainframes ta PCs. Boston, Aug. 13-14 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Windaws/Faii Conference and Expasitian. Boston, Aug. 15-17 — Contact: CM Ventures, Emeryville, Calif. (415) 601-5000.

AUG. 19-25

Eastern Regianai ISSA Conference. Washington, D.C., Aug. 19-21 — Contact: Ralph S. Poore, Baltimore, Md. (301) 783-3865.

Relatianal Taday Seminar. Palo Alto, Calif., Aug. 20-21 — Contact: Codd and Date, San Jose, Calif. (408) 441-6400.

Strategic infarmatian Systems Conference. Boston, Aug. 20-21 — Contact: University Seminar Center, Boston, Mass. (617) 248-8066.

Summer Warkshaps far the infarmatian Pracessing Prafessianai. Nashua, N.H., Aug. 20-23 — Contact: Ouellette & Associates, Bedford, N.H. (603) 623-7373.

SCO Farum '90. Santa Cruz, Calif., Aug. 20-24 — Contact: The Santa Cruz Operation, Santa Cruz, Calif. (408) 425-7222.

Early, Ciaud & Ca.'s Summer Canference an Teiecammunicatians. Newport, R.I., Aug. 22-23 — Contact: Early, Cloud & Co., Newport, R.I. (800) 322-3042.

AUG. 26-SEPT. 1

Natianal Computer Graphics Assaciatian Canference and Expasitian. Houston, Aug. 26-29 — Contact: NCGA, Fairfax, Va. (703) 698-9600.

Unix Security Warkshap. Portland, Ore., Aug. 27-28 — Contact: Usenix Conference Office, El Toro, Calif. (714) 588-8649.

SEPT. 2-8

FED Micra '90. Washington, D.C., Sept. 5-6 — Contact: National Trade Productions, Alexandria, Va. (703) 683-8500.

Strategic Planning far infarmatian Systems. Toronto, Sept. 5-7 — Contact: Barnett Data System, Rockville, Md. (301) 762-1288.

SEPT. 9-15

Adding image Pracessing ta infarmatian Systems. Toronto, Sept. 9-11 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

Open Systems Appiicatians Deveiapment Canference. San Jose, Calif., Sept. 9-12 — Contact: Unify, Sacramento, Calif. (916) 920-9092.

impiementing TCP/iP far Systems integratian. Washington, D.C., Sept. 10-11 — Contact: Data-Tech Institute, Clifton, N.J. (201) 478-5400.

Executive infarmatian Systems: Fram Pianning ta impiementatian. San Francisco, Sept. 10-12 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

The Repasitary Canference. Orlando, Fla., Sept. 10-12 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Gupta Deveiapers Canference: Opening Windaws to SQL. San Francisco, Aug. 19-22 — Contact: Gupta Developers Conference, Andover, Mass. (800) 767-2356.

Optical Infarmatian Systems '90. Arlington, Va., Sept. 11-13 — Contact: Meckler, Westport, Conn. (203) 226-6967.

Where the air is thin and the view is big

BY DAVID LUDLUM

When an information systems executive wins a seat at the big conference table with the cadre of top managers who devise strategy for his organization, he's bound to feel uncomfortable. And it could take a while before that feeling goes away.

No matter what one's abilities and accomplishments, moving into this circle calls for some adjustments.

An IS strategist must refine the way he looks at technology, his business and himself. He must hone new skills and personal characteristics. He must take on unfamiliar tasks while relinquishing more comfortable roles.

Britain Hill

Travelers' Brophy *says hobbies may have to take a backseat during adjustment to new responsibilities*

Shifting to high gear

The first thing a new holder of this post should be prepared for is intense work as he gets acclimated. "You work twice as hard initially to learn and understand the environment," says Joseph Brophy, formerly the top IS executive at The Travelers Corp. and now president of Travelers Insurance Co. "You just have to plow through."

While he was in that plowing stage, Brophy says he concentrated on doing the work that promised the best payoff. He also made use of time at home, reading science books and magazines that offered useful insights instead of engaging in more idle pastimes, such as playing the bagpipes.

For the past two years, Brophy has been acclimating himself all over again, this time to the jobs of business unit manager and president. Now he's easing up; he just spent a week at his vacation home in Lake Sunapee, N.H., relaxing and getting reacquainted with his neglected bagpipes. "This is the first time I've really forgotten about work," he says. "It feels great."

There is a steep learning curve at first in any new job, but a newly minted IS chief has a particularly difficult climb.

Probably the first item of business for anyone promoted to the top job is to figure out how to safely take his hand off the wheel and let others manage the day-to-day business of the IS department.

"There's a dichotomy," says Richard Koeller, vice-president of information technology at Whirlpool Corp. "You need to work with global issues. At the same time, if the data center goes down, you're the one that other people look at." In the background, there's pressure to maintain services and keep costs down.

The way that Koeller resolved this quandary was to settle responsibility quickly and squarely on his functional directors. He immediately rewrote their job descriptions, splitting his duties among them and giving them authority for nonstrategic decision-making. He also stopped attending staff meetings, which served to seal the transfer of responsibility. If the directors wanted his input, they'd have to ask for it.

What happened, Koeller says, is that the directors rose to the new responsibilities. The IS operation continued to run smoothly, and some positive new ideas came out of the situation. For example, one of the newly empowered directors implemented a program for management backup and succession, cross-training and long-term recruiting for his operation, which other units have now adopted.

There are more tactics that could be used to encourage others to assume the responsibilities you will have to give up, Koeller says. You could change the reports that the managers prepare or give them new offices. Basically, he says, it is just important to "do something dramatic to break the stride and let people know it isn't business as usual."

Of course, if you are coming in from someplace else to head up the IS function, the problem isn't breaking old habits to create distance but, rather, learning how things operate. You can't start thinking about strategic plans until you know where you are.

Every new organization calls for a period of assessment, says DuWayne Peterson, head of operations, systems and telecommunications at Merrill Lynch & Co. When people fail at a new company, it is usually because they neglect to adjust their views to it. He learned that lesson earlier in his career, he says, when Citicorp hired him, along with some other industrial managers, to apply manufacturing techniques to its operations.

Easy on the zeal

In retrospect, Peterson realizes that the group tackled the task a little too zealously. "We thought we were God's gifts to the world," he says. "We came in with an arrogance that made it much more difficult to get the job done."

One example of that arrogance, Peterson says, is the way the new arrivals scrapped an existing accounting system and replaced it with one they knew better. The problem with that, he explains, is that the new accounting system, which had been adequate for a factory situation, didn't track customer accounts as closely as users needed or even as well as the old system had. "We just blew past that [requirement]," Peterson says. "We thought it wasn't important. The customers were not too happy."

Whether you are coming from inside or out, most IS executives

Ludlum is a *Computerworld* senior writer.

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Sage advice for the IS warrior
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View

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who have moved into positions that include large components of strategic planning agree that it is important to take time to familiarize yourself with the business operations and the business environment before you start trying to draw up any plans. And the first and best way to start gaining that knowledge, they say, is by tapping into the experience base around you.

Get to know the 'smart guys'

Brophy says he learned to identify the "smart guys" around him — people with a record of consistent achievement — and synthesize their thinking into his own.

Of course, identifying managers with expertise and vision is more difficult when both the industry and the company are new to you. But, Peterson says, it does not take all that long to figure out "which people are stronger and which ones were terrific yesterday but aren't going to carry you forward."

Michael Zucchini, chief information officer at Fleet/Norstar Financial Group, agrees that the real trick is to network with people in the know. Sometimes it takes determination to seek these people out, but the effort pays off. Conversations with the right managers can reveal important subtleties, he says, such as the type of judgment calls a loan officer makes. Lunch is a good forum; Zucchini got into the habit of lunching with executives, spending an hour asking about their business.

Another good way to familiarize yourself with business issues, IS executives agree, is creating opportunities to meet company customers. "I don't think you can develop a strategic system without a good understanding of what customers value," Zucchini says.

Security Pacific's Heschel *made sure he visited customers*

When Michael Heschel, now chairman of Security Pacific Automation Co., was heading up IS at Baxter Healthcare Corp., he not only attended focus groups that the company held to obtain input on changes to its ASAP order-entry system but made a habit of checking in with customers during business trips. He forced himself to set up these customer meetings six months in advance to make sure they took place, he says, because this wasn't something he was expected to do, and it would have been easy to let it slide.

Levi Strauss' Eaton *tries to remain open-minded*

When you know IS operations are under control and you have a firm grasp on business issues and priorities, you can turn your attention to strategic concerns. But be prepared for the fact that the perspective may seem strange at first.

Even IS issues can look significantly different from this angle, says Max Hopper, senior vice-president of IS at American Airlines. "The issues are certainly less well defined," he says. "Methodologies are less precise; the time frame is longer, and you don't always know all the variables. You have to rely more on intuition."

You almost need a whole new mind-set, Koeller says. He likens an IS director adjusting to the role of strategist to that of a soldier moving from the front line to a military staff assignment. His reactions are geared to short-term survival when he needs to become almost philosophical.

There are other mental adjustments as well, such as figuring out how much innovation is really tolerable. While IS people are inured to constant change, senior business managers sometimes want tomorrow to be like yesterday. "When you're trying to put out 14,000 washers a day, you don't want change," Koeller says. "I had to recognize that, at this level, I'm not in the business of changing daily."

He has learned, he adds, to peg his planning to the readings he gets from managers reacting to his questions.

Keeping yourself in sync with business managers requires regular contact, however, which is one of the reasons why Metropolitan Life Insurance Co. formed a steering committee to help set technology strategies. Dan Cavanaugh, senior vice-president of IS, heads the committee, which is made up of business unit chiefs. They share experiences and talk about such things as the benefits of compatible systems and the potential impact of imaging or expert systems.

Cavanaugh makes sure that business managers are briefed before meetings by sending them reports and articles. He also ensures there's a worthwhile agenda. The group usually meets monthly but cancels two or three times a year because convening wouldn't be worthwhile. The managers also go off-site occasionally for briefings from vendors or consultants, sometimes for two days.

Bank of Boston's Simmons *believes in a sixth sense*

It really can help to get managers together and away from distractions, says Bill Eaton, CIO at Levi Strauss & Co. Top managers at that company build understanding with off-site meetings focused on issues they find hard to tackle in the midst of day-to-day activities.

Usually, however, dealings with the chief executive officer won't happen in that kind of relaxed and contemplative kind of setting. The process of communication takes on more urgency when dealing with the top executive. Issues are bigger and time more limited. "You have to do your homework well, know what you're going to communicate and, because of the time constraints, how you're going to do it," says Heschel, who recalls that his formal meetings with the CEO at Baxter typically lasted about half an hour.

Take a look at yourself

The flip side of dealing with and understanding other managers is crucial, too. An IS executive needs to know how fellow strategists view him.

"Information technology people are perceived as being a little weird," Koeller says. "We are totally challenge-driven. Style and social value don't mean much. The higher the risk, the more we like it."

Koeller has taken courses, which a number of training companies offer, that teach managers to recognize how their colleagues view them. This is a particularly important point when moving from a homogeneous IS group to a diverse top management team.

"I need to understand how my personality and style affects what I'm trying to achieve," Koeller says. "If you spend all your time around Americans, you aren't going to have a very good idea of how Europeans perceive you."

Koeller says he has found that the only way to dispell the notion that an IS person is "wierd" is to sit down with the skeptic and show an understanding of his business or a desire to learn about it.

Whomever you happen to be meeting with, certain diplomatic skills are crucial.

Eaton has found, for example, that it is important to maintain a healthy attitude toward conflict. Sometimes there's a need for a winner and a loser, he says, but part of the job of any planner is to encourage new ideas by creating room for

Upward mobility

Gaining strategic responsibility usually has less to do with luck than planning and a steady accumulation of skills and influence.

For many of today's strategists, the key has been to broaden experiences and expertise. They've taken advantage of training, study committees, job rotation programs, transfers and other opportunities.

When he was younger, Joseph Brophy had a philosophy that to get ahead, he needed to be a double or triple threat — to know more than one field. Brophy, formerly the top IS executive at The Travelers Corp. and now president of Travelers Insurance Co., started his career as an actuary. Combining that background with work in IS broadened his outlook and background, he says: "I had two disciplines I could bring to the equation."

Brophy also says he felt he could take on bigger jobs more quickly by making lateral moves; it would be tough just rising vertically. That notion seemed to be borne out two years ago, when Brophy made a lateral move from top IS executive to head of The Travelers' employee benefits business. Earlier this year, he was promoted to president of the company that handles that line.

One way to help accelerate the rise to the top is doing a stint as a planner. It's a good way to learn an organization, says DuWayne Peterson, executive vice-president for operations, systems and telecommunications at Merrill Lynch & Co.

A first move toward gaining a position in planning might be to pursue an MBA program, where one can learn the techniques involved, Peterson says. It's hard to learn how to implement plans from a textbook, however, because the process is different at every company. So the next step is to find an employer with a commitment to planning.

Strategic boost

Michael Heschel, chairman of Security Pacific Automation Co., got a career boost when he was chosen to lead a strategic planning project at FMC Corp. The project was highly quantitative; Heschel knew industrial engineering and statistics and held an MBA. "Someone from planning with a plain vanilla MBA wouldn't have had the right perspective," he says.

Participating in this kind of planning project can broaden perspective. Planning methodologies can get tactically oriented people thinking about strategy — how to gain market share, for instance, Heschel says. He found that the project he led made a good education program for managers.

IS executives also advance their careers by moving to a new company. In his early 30s, Brophy left The Prudential Insurance Co. for The Travelers, thinking he would move up more quickly as a bigger fish in a smaller pond. Likewise, early in his career, Max Hopper, senior vice-president of IS at American Airlines, left Shell Oil Co. to join Electronic Data Systems Corp. His goal was more freedom. "It was a chance to fail," Hopper says. "It was a chance to be entrepreneurial."

Taking chances and seizing opportunities is at the heart of learning the ropes. Michael Simmons, who has been top IS executive at Fidelity Investments, Bankamerica and Bank of Boston, suggests avoiding overly rigid career plans. Some people hold themselves back by planning too carefully and then passing up opportunities that aren't part of their plans, he says. "When opportunities present themselves, I take them."

DAVID LUDLUM

disagreement. For that reason, Eaton is careful to avoid signaling disagreement with gestures as he tries to maintain an open-minded stance.

Staying open-minded doesn't mean never taking a stand. If you are convinced that you understand everyone's point of view and still believe that the idea they are rejecting is good, many IS chiefs say that heavy lobbying is warranted. Everyone thinks about the future and prepares for it, Eaton says. Strategists must be willing "to put a stake in the ground" and share how they see the future.

"You really have to sell your plan," Peterson says. To do that at Merrill Lynch, he says, he makes sure to get the business benefit out front.

If that doesn't work, Brophy suggests dropping down a couple of levels to try to build a ground swell. In one instance in which he encountered entrenched resistance from a business manager, Brophy got his staff working with the business manager's people.

"You've got to try a lot of different ways," he says. "You work with his peers. You get other voices in the organization supporting your point of view. You can never do this as a one-man band."

To test your own convictions, try doing some Walter Mitty-ish mental role-switching, says Eugene Bedell, until recently the top IS executive at First Boston Corp. and now president of the bank's technology spin-off, Seer Technologies, Inc. When in doubt about a strategy move, he says, he thinks about what he would do if he owned 100% of his company's stock. "That probably helps more than anything else," Bedell says.

Keeping an eye on the future also helps IS strategists be both active and effective. Brophy visits AT&T Bell Laboratories to follow technology. Peterson is studying changes to the Glass-Steagall Act, which would let banks and insurance companies compete with Merrill Lynch, and trying to figure out what the impact is likely to be on markets and market share.

Brophy reads about prospects for changes that are broader still — demographic trends, for example. "That stuff can be fun to read and make you much more knowledgeable about the business environment," he says. Changing management and organizational structures are among the areas that Brophy watches with particular interest.

Michael Simmons, who is in charge of systems and operations at Bank of Boston Corp., emphasizes the importance of peripheral vision and instinctual feel. Don't get in a position where you don't see everything and try to keep in touch with gut instincts, he recommends. He adds, "There's an underlying sixth sense that says, 'I haven't looked at this enough.'"

Of course, there is such a thing as being overly cautious. Simmons says he made a mistake in overlooking personal computers in the early 1980s. He regarded them as more hype than reality. "I missed some opportunities to do things sooner," he says.

Merrill Lynch's Peterson *warns: Curb your ego*

Learning to live with regrets, hard decisions and tension is part of the job, too. Some executives moving up the corporate ladder worry about losing touch with former peers.

Hopper started feeling the distance as he rose at Shell Oil Co., where he started his career as a systems engineer. "We played cards every day at lunch and had a good car pool. There was a lot of camaraderie," he says. To keep in touch today, he invites subordinates to dinner and parties.

However, there will always be moments when you just have to put up with people not liking you. At FMC Corp., Bedell had to deal with the fact that some business units, which top executives regarded as low priority, could not be supplied with new systems. "When you deal with the guys who run those divisions, they're not real happy with you," he says.

Bedell would emphasize that he didn't establish corporate priorities, although he might agree with them. There's not much else you can do, he says, except maybe get out of town.

The IS chiefs who intend to stay learn various tricks for successfully dealing with the bad days. Usually, Simmons keeps himself loose by taking brief walks. Last year he strolled up and down the stairs of the Bankamerica building in San Francisco pretty regularly when, as that organization's highest IS executive, he had to deal with the aftermath of the big earthquake. •

> "THE IS ISSUES are certainly less well defined. Methodologies are less precise; the time frame is longer, and you don't always know all the variables. You have to rely more on intuition."
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The Past, Present, and Future of Network Computing.

Tactical advice from an old soldier

BY AVERY CLOUD

The writings of Sun Tzu are touted in academic circles as a "must read" for any serious leader. Nearly 2,500 years after the Chinese general's death, *The Art of War* is required reading for Soviet political and military leaders, and American executives also find its advice useful.

The book teaches how to compete, implement strategy and defeat opposition — all critical skills for the business leader. Sun Tzu speaks to information systems managers as well, who likewise find themselves in an environment where being skilled strategists and competent combatants are critical factors for success.

The following are a few of the juiciest morsels of Sun Tzu's wisdom annotated for IS executives.

"He will win who knows when to fight and when not to fight."

The IS manager should choose his battles carefully. Winning some fruitless battle for the sake of ego may alienate important allies. Better to make sure the benefit is worth the risk and that victory is possible. The guiding light for selecting battles should be how important the issue is to corporate strategy and corporate welfare.

It is foolhardy, for example, to get involved in a hot debate over which software product to select when both are equally functional. I have seen technical wizards derail their careers over such small points — just to prove that they knew best.

When the issue is important, however, be willing to face conflict. I remember a brave IS professional who challenged a high-profile executive who wanted to move some key applications to a service bureau. This IS samurai believed that the move would be financially and strategically disastrous.

In the end, he won over the opposition, but before doing battle, this manager had checked his technical ammunition and ensured that his position and advantage were sufficient to deliver victory. He used his political network to win senior managers over to his side. He held informal meetings to garner support. Most important, he spent a lot of time assembling irrefutable facts and figures to support his position.

"He will win who knows how to handle both superior and inferior forces."

The method of engaging in conflict varies depending on the combatant's level of power and influence. When in an inferior position, the IS manager must use finesse and persuasion to get approval of his agenda. He must show that his approach will produce desirable benefits for the high-level decision-makers.

For example, after failing to gain approval for a new print technology in his company, an IS manager who saw he was outgunned politically and numerically changed his approach immediately. Instead of trying to prove the technical feasibility of his idea, he showed how this new technology could make the decision-makers look good.

He also made sure management knew that the company's chief competitors were already exploiting this technology. Soon management not only agreed but also demanded that the new technology be brought in.

"He will win whose army is animated by the same spirit throughout all its ranks."

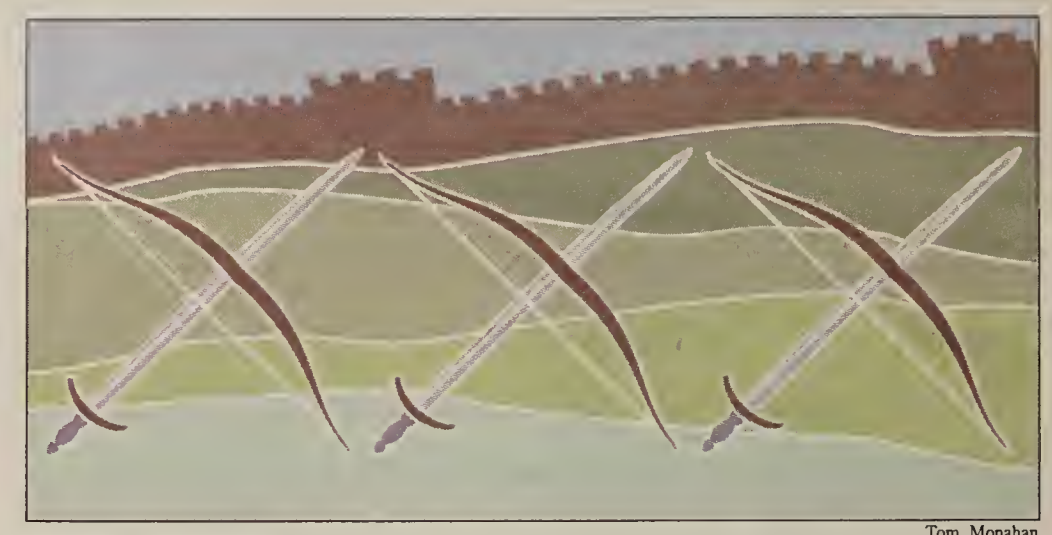
An IS manager should also be aware of the need to gather support and build morale among the troops.

If you have a sufficiently large staff of talented people, for instance, learn how to tap this resource and motivate them to innovate and produce. Work on improving staff efficiency and effectiveness by developing incentive and reward structures in your department. Monetary rewards are a good device, but simple things like posting accomplishments on bulletin boards, giving a day off after extra effort or sending a short complimentary note can motivate a staff to stellar performances.

If you have fewer staff resources to work with, learn to focus what is available on high-yield projects. Table projects with low return, or set them up with long completion cycles. Look for productivity tools to increase individual output. Train extensively, but make sure your training efforts are focused narrowly on skills critical to the success of strategic projects.

To animate their groups, managers must first develop a vision and purpose, then evangelically espouse the goals and ideals that they want workers to adopt.

When I was a system programmer at RJR Nabisco, Inc., we were continually told that we were a leading-edge, leader-of-the-pack IS operation. We were told how far ahead of our competitors we were and how important that was. Instilled with that kind of spirit and pride, I witnessed top-level technical performance and innovations consistently produced.



Tom Monahan

There is no better vehicle for communicating competitive spirit than the spirited words of IS leaders in meetings and conversation. Keep your employees — especially talented ones — happy by keeping them informed of the successes and failures of the company and how IS contributed.

"He will win who, prepared himself, waits to take the enemy unprepared."

Detailed knowledge about the issue being promoted or defended can be a lever to win control and influence. Achieving this superior preparedness quickly can catch the opposition in an indefensible position.

I was once called on to defend the chargeback billing rates to a senior executive. After talking to him, I noted that he had little foundation for his belief that he was paying too much for IS labor.

I let him think he had a case for a few weeks and lulled this executive into a false sense of security. During this time, I studied our billing system feverishly and found that only 3% of each penny billed went toward IS labor. I also identified a 60% increase in his processing load as the cause for his high bills.

I then called a meeting on short notice and presented the facts. Having no information to support his dispute, the executive graciously conceded his mistake and offered to buy me lunch, while my boss beamed.

"He will win who has military capacity and is not interfered with by the sovereign."

While developing the skills of your IS organization, also develop a relationship of trust between you and your superiors. Meet your deadlines and keep your promises.

A friend of mine, who is a competent IS professional, takes this philosophy to heart. When he took charge of the data center of a large firm, he immediately seized every oppportunity to perform duties that his boss used to have to worry about. He made sure that he kept his promises to his boss and his users. He consistently filed informative status reports. Soon he developed a reputation as someone who had the talent and dependability to get things done. Now his boss gives him everything he asks for and never interferes with his decisions.

Being responsible and encouraging your superiors to entrust responsibility to you will help your superiors see the importance of giving you the authority to complement your responsibility. Keeping your superiors well informed will make them more apt to allow you greater command.

"If you know the enemy and know yourself, you need not fear the result of a hundred battles. If you know yourself but not the enemy, for every victory gained you will also suffer a defeat. If you know neither the enemy nor yourself, you will succumb in every battle."

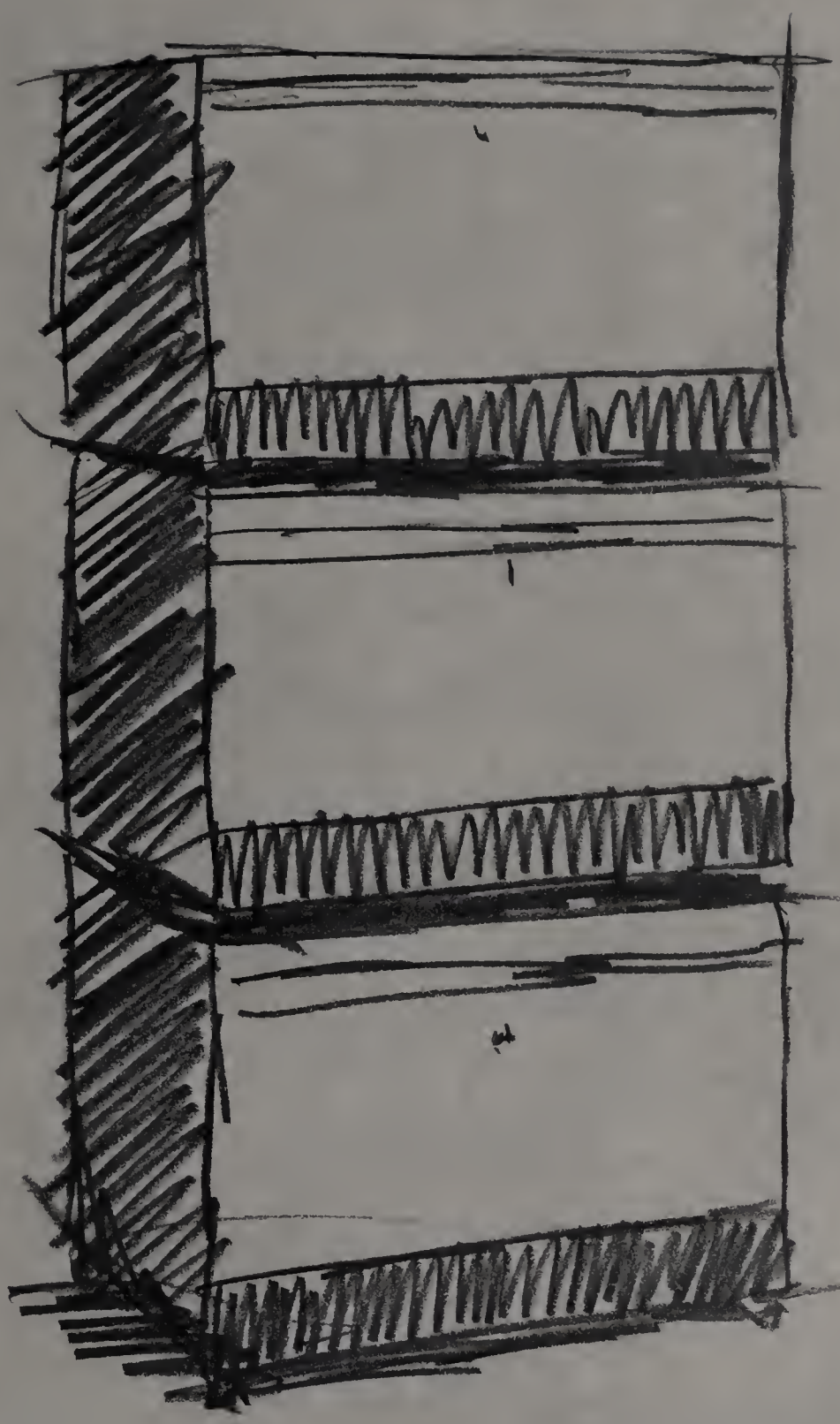
Know the opponent before stepping out on the field. Assess the IS strengths and weaknesses of other companies in the industry. Valuable competitive information can be procured from several sources, such as trade publications.

Becoming a member of good IS and industry professional organizations affords the opportunity to meet informally with competitors and sit in on revealing presentations and talks. Look for opportunities to tour competitors' facilities.

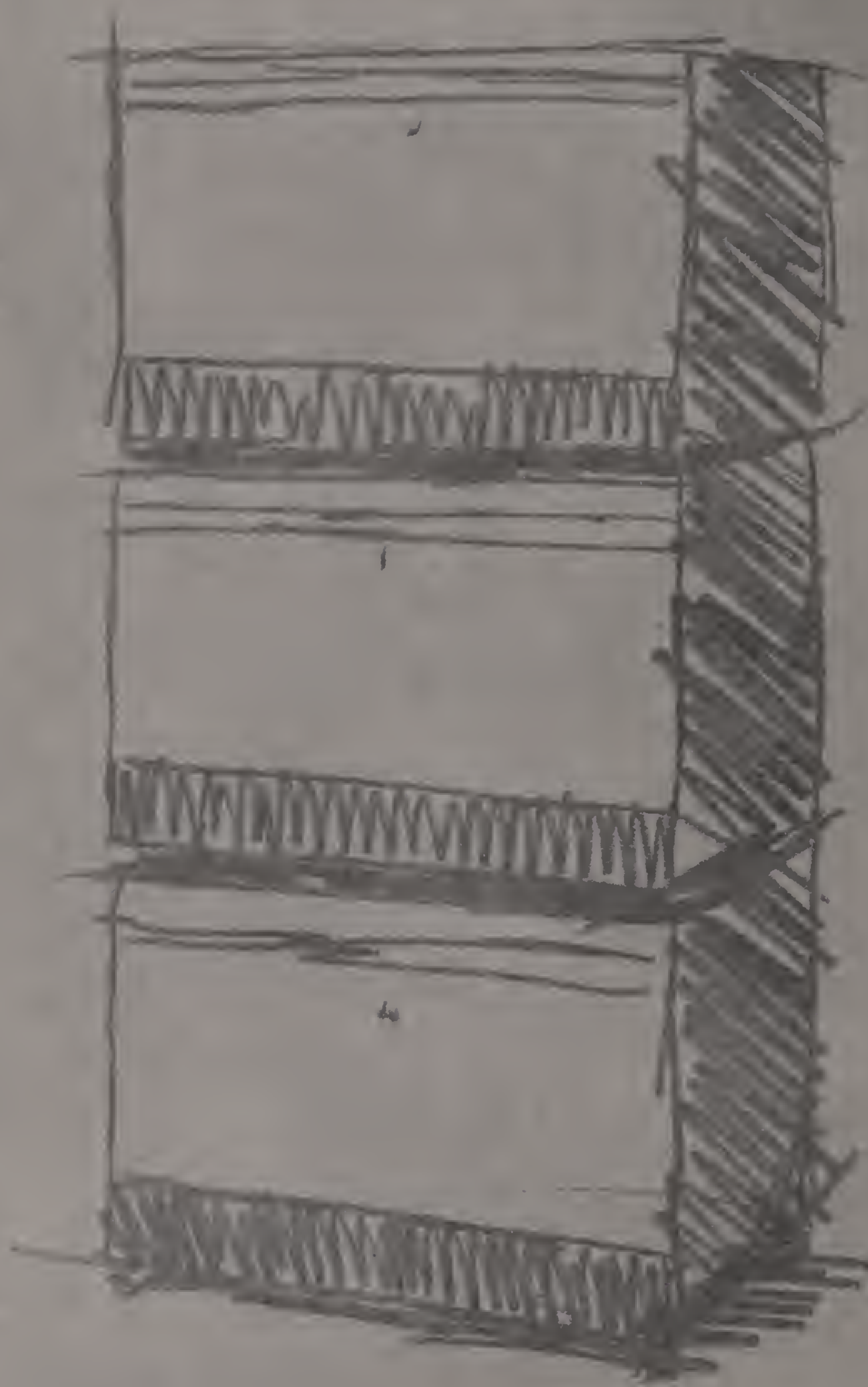
Regularly assess your own IS strengths and weaknesses. Compare available manpower, work-force skills, financial constraints and technological position with competitors to see if launching a competitive IS assault is feasible. If the answer is yes, it is time to market the ideas to senior management. Otherwise, focus on finding ways to manage current technologies more cost-effectively.

With the encroachment of global competition and current economic stresses, companies are fighting for survival. Sun Tzu's wisdom in *The Art of War* can help IS managers help their companies win this war. •

Cloud is manager of technical services in the information services department at Bowman Gray/Baptist Hospital in Winston-Salem, N.C.



How everyone else gets their great ideas.



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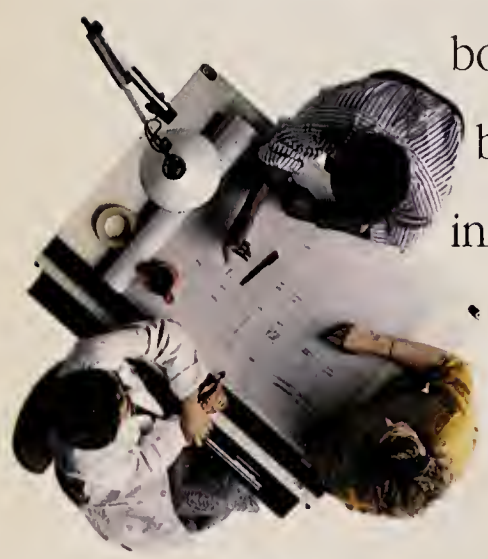
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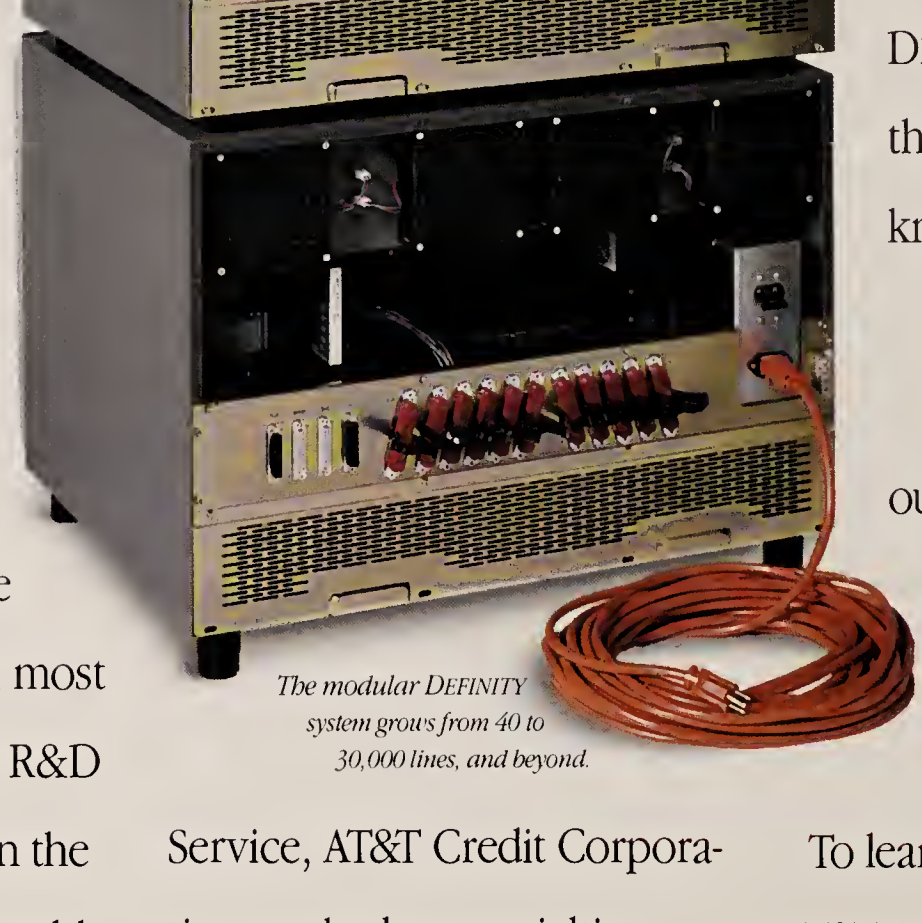
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Cobol — The next stage

It's time to modernize an old faithful by adding object orientation

BY JEROME GARFUNKEL

It's time to get COOL — Cobol object-oriented language, that is.

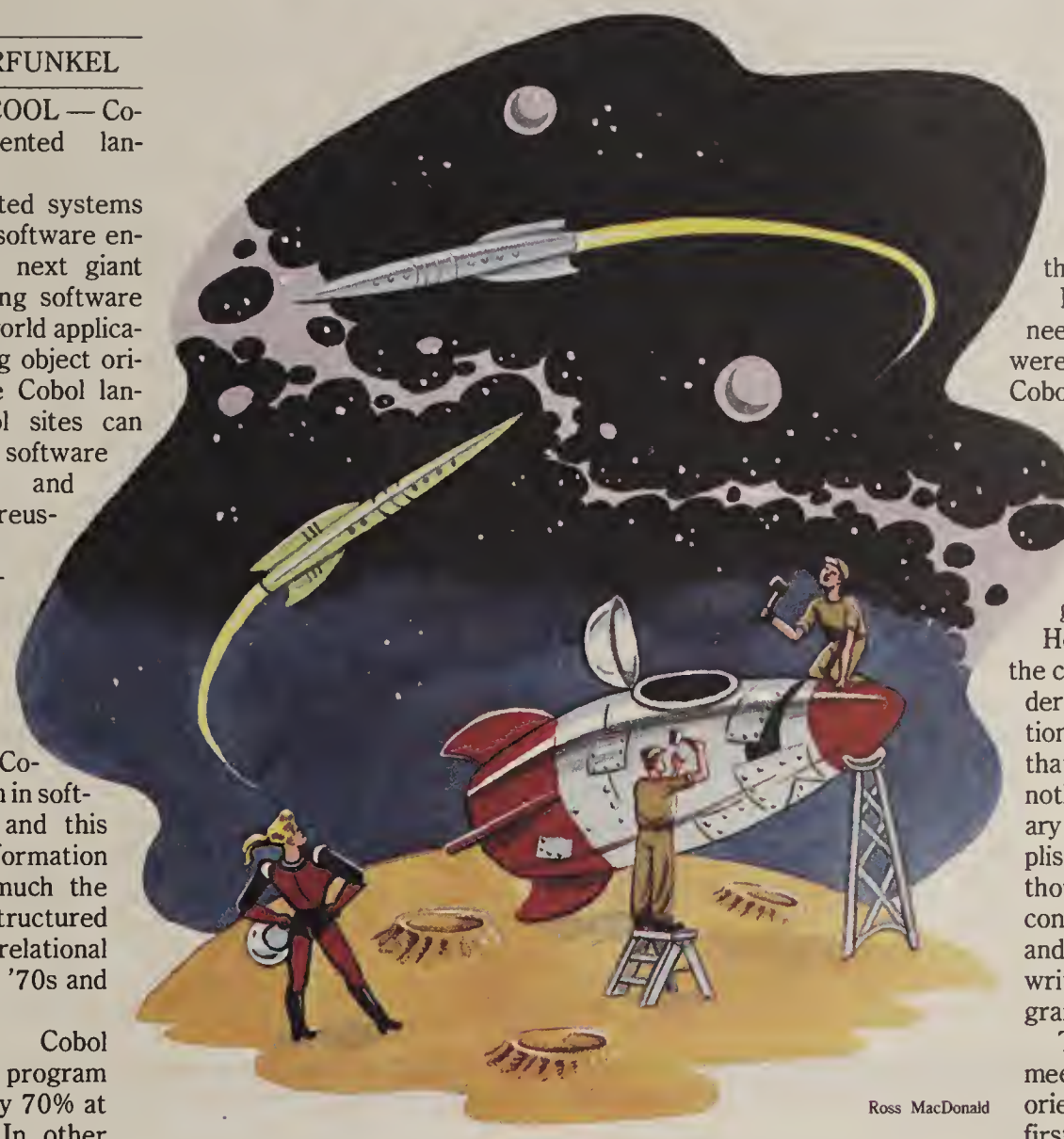
Object-oriented systems are viewed by software engineers as the next giant step in designing software to match real-world applications. By adding object orientation to the Cobol language, large Cobol sites can enjoy the improved software development ease and maintenance that reusable code provides.

The key issue today is to get object-oriented Cobol out of standards committees and into practice.

Object-oriented Cobol is a breakthrough in software engineering, and this will affect the information systems world in much the same way that structured methodologies and relational databases did in the '70s and '80s, respectively.

Object-oriented Cobol could cut down new program development time by 70% at large Cobol sites. In other words, 70% of all Cobol application code now written could be reusable as objects invoked by new programs. This has enormous implications for applications maintenance.

Cobol programs employing object-oriented designs would also be more readable because object orientation offers a real-world modeling facility for computers.



Ross MacDonald

Until we meet again

In November 1989, a significant meeting was held in Scottsdale, Ariz. It was a symposium sponsored by the Codasyl Cobol Committee to explore the relevance of object-oriented methodologies to the Cobol language.

Only once before in its 30-year history has the Codasyl Cobol Committee addressed a single issue at a special meeting. In 1975, the committee held a symposium in Los Angeles to solicit suggestions from software engineers around the world on how to change the Cobol language to accommodate structured programming techniques. Papers with specifics on how to add or modify syntax to the Cobol language to deal with these new theories were received from the likes of industry notables Ed Yourdon, Michael Jackson and Chuck McCooms.

Most of the new features added to the ANSI Cobol 85 language have their roots in that symposium held in 1975. Some of these features include nested programs, scopeterminators, the EVALUATE statement, the "in-line" PERFORM statement and the "Do-While" and "Do-Until" constructs of the PERFORM verb.

Leading software engineers from around the world were also present at the 1989 Cobol meeting. Representatives from major Cobol suppliers, as well as some of Cobol's largest users, were there too. Debate centered on making the Cobol language object-oriented.

How radical a change must the current Cobol language undergo to adopt object orientation? Attendees grappled with that question: Some felt that nothing short of revolutionary changes would accomplish the mission; others thought that Cobol already contained much of the syntax and semantics necessary to write object-oriented programs.

The discussion at this meeting centered on object-oriented concepts. One of the first tasks of the Codasyl Cobol Committee was to achieve general agreement concerning the meaning of these concepts as they relate to the Cobol language. Discussions took place in the following areas:

• **Orthogonality.** One of the key issues discussed at the Scottsdale symposium dealt with how to implement any new object-oriented functionality that may be introduced into Cobol. Should it be done consistently, using current Cobol syntax and expanding the semantic definitions wherever necessary? This method adds a minimum of new syntax. Should it be done orthogonally by adding an entirely new layer of object-oriented syntax to Cobol in harmony with current object-oriented terminology? Some in attendance felt that the latter suggestion was

Garfunkel is president of Jerome Garfunkel Associates, Inc., a Cobol consultancy in Litchfield, Conn.

• Standards issues loom

• Up to 70% of exisiting code reusable

• Object-oriented compilers seen by 1992

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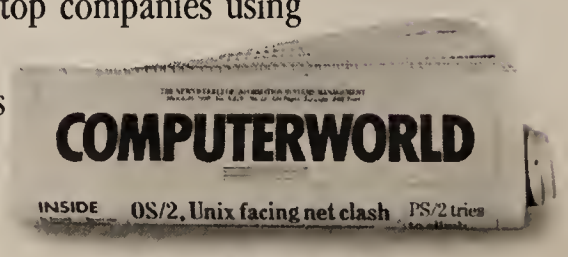

The Newsweekly of Information Systems Management

tantamount to adding a whole new language on top of the Cobol language. In that case, why not simply decide to use another language?

• **Recursion.** Recursion refers to the ability of a program (or subprogram) to be re-entrant; that is, to be able to have multiple copies executing simultaneously while keeping any passed parameters in a carefully controlled stack with each level in the stack linked to a specific instance of the subprogram.

• **Polymorphism.** Polymorphism is necessary for similar or identical objects to behave differently when passed different messages.

• **Encapsulation.** This is the ability to make old Cobol programs into objects that can be used by newly developed object-oriented Cobol programs. The concept of classes will need to be added to Cobol so that when an object is developed that is an offshoot of an already existing object, it may "inherit" the characteristics of that object and define additional characteristics that make it a specific, yet distinct, instance of the object.

A facility for Cobol programmers to define their own syntax, complete with verbs and formats, is one way to create objects and pass messages to them. This concept of user-defined Cobol syntax has been under investigation for more than a decade in the UK.

Unanimous agreement

While the debate raged about concept meanings, there was unanimity on one particular issue: The Codasyl Cobol Committee passed a motion to create an Object-Oriented Cobol Task Group by a vote of 11 to 0.

Codasyl's object-oriented Cobol goals include the following:

• Compatibility with existing Cobol language syntax. That is, no new syntax will be added to make older Cobol programs obsolete.

• Simplicity of language features, including "obviousness" of semantics with simple and direct syntax.

• Consistency with current Cobol syntax and semantics; that is, the behavior of any well-defined Cobol features will not change.

• Maximum power in language features (more bang for the buck).

• Readability (an objective of Cobol since 1959).

• Minimum changes to runtime operations.

• Encapsulation of old code in an "object wrapper," thereby allowing the current huge inventory of Cobol programs to potentially work with the newly created and designed object-oriented Cobol programs.

• Orthogonality of new features (distinct from old Cobol).

• High performance in runtime, compilation time and development time.

• Transformability, or the ability of an object to adapt to various different uses in different environments with a minimum amount of effort.

For object-oriented Cobol to become a reality, certain bureaucratic procedures must be followed, including a syntax and semantics proposal process, debates and presentations to the American National Standards Institute (ANSI) and International Standards Organization (ISO) Cobol committees.

The first step is for the newly created Object-Oriented Cobol Task Group to propose suggested object-oriented Cobol syntax and semantics for inclusion in the Cobol Journal of Development, the working document maintained by the Codasyl Cobol Committee. I often refer to this document as an Experimental (Conceptual) Cobol Model.

Once the full Codasyl Cobol Committee accepts these changes (after some debate, of course), it must then simultaneously present them to the ANSI X3J4 Cobol Committee and ISO [WG4] Cobol Committee for processing as an official U.S. and international standard. This, too, will surely require some debate.

It is estimated, however, that if the various committees were to follow normal procedures, it would take 10 years for the ANSI and ISO Cobol standard language to include new object-oriented syntax. It would take three to five years after that before it would come into mainstream use.

To speed the process, the Codasyl Cobol Committee could ask the Object-Oriented Cobol Task Group to prepare a draft of proposed changes to the Codasyl Cobol Journal of Development. The changes would be in a format consistent with an ANSI Cobol addendum.

Adding object-oriented Cobol syntax as an addendum to the ANSI Cobol language will accelerate the process by many years. This is exactly why the addendum process was created.

Having the Object-Oriented Cobol Task Group prepare its draft of proposed changes in the addendum format will also save the ANSI Cobol Committee from having to translate the Object-Oriented Cobol Task Group proposal into the addendum format later when it considers adding object-oriented syntax to the ANSI Cobol standard.

Furthermore, if the Codasyl Cobol Committee can closely monitor the progress of the Object-Oriented Cobol Task Group as it is debating and hammering out the new suggested object-oriented syntax during the next year or so, it will be able to make suggestions to the task group along the way.

This will prevent the likelihood that a proposal to Codasyl from the Object-Oriented Cobol Task Group will be sent back for a major rewrite following some lengthy debate at the Codasyl Cobol Committee's table.

Likewise, if ANSI closely monitors the development of the object-oriented syntax within the Codasyl task group, this will reduce the likelihood of major changes when the proposed new syntax is presented to ANSI for inclusion into the Cobol language as an addendum.

Fortunately, there are some members who serve on all three of the committees involved in this process (Object-Oriented Cobol Task Group, Codasyl and ANSI) and can thus provide this close monitoring function.

Note of encouragement

One other encouraging note is that although no Cobol vendor will commit today to an early release of object-oriented Cobol, it is likely that once the proposed object-oriented Cobol syntax is accepted by the Codasyl Cobol Committee, some Cobol vendors may go ahead and add this syntax (or similar syntax) to their Cobol compilers as vendor extensions. They won't wait for it to become an official ANSI Cobol standard.

This has been done in the past by some Cobol vendors anticipating the Cobol 85 extensions; there is no reason why it will not happen again with object-oriented Cobol extensions.

The bottom line of these procedural alternatives is that the Cobol community could have some usable object-oriented Cobol compilers sometime in 1992. •

Language barriers

The Codasyl symposium in Scottsdale zeroed in on key issues that the Object-Oriented Cobol Task Group as well as the Codasyl Cobol Committee must address. These include the following topics:

• Programmer re-education. Companies will have to re-educate an entire generation of Cobol programmers to take advantage of object-oriented methodologies. Re-education was an issue in the 1970s with the introduction of structured methods; this new methodology will require even more dramatic and traumatic re-education.

• How to deal with the installed base of Cobol programs.

• Prioritization of goals and viewpoints.

• Quickness of standards definition vs. completeness of specification (object-oriented programming systems design features).

• Orthogonality vs. consistency.

• Adding significant language features, such as pointers, recursiveness, user-defined functions, "garbage" collection, exception handling, persistence (long-lived programs), returning values from CALLs.

• Single or multiple inheritance.

FOR OBJECT-ORIENTED Cobol to become a reality, certain bureaucratic procedures must be followed, including a syntax and semantics proposal process, debates and presentations to the American National Standards Institute and International Standards Organization Cobol committees.

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Fireworks

Last year's vaunted "merger of equals" continued to give off sparks last week. Only days after **Stardent Computer, Inc.'s** chairman and co-founder hauled the company's strategic ally and 22% owner into court on charges of conspiring to steal technology [CW, July 16], **Legent Corp.** announced yet another shift in its management roster: this time, the resignation of President **Peter Barris** and the appointment of co-founder, former chairman and recent special projects manager **Mario Morino** as executive vice-president and general manager of the company's information systems division.

C-man

Mini- and microcomputer systems integration company **C3** wants a bigger slice of its target market, and now, according to its chairman, it has the money and the man for the mission. Along with a financial recapitalization, the Herndon, Va.-based company last week announced a new president, chief executive officer and director: **Anthony L. Craig**, an IBM veteran who was also credited with turning around General Electric Corp.'s then-troubled GE Information Services division. Most recently, Craig served as chief executive at **Prime Computer, Inc.**, presiding over the company as it battled a hostile takeover attempt by MAI Basic Four, Inc.

Round numbers

Radius, Inc., the San Jose, Calif.-based visual computing systems vendor that claims to have brought high-performance, graphics-intensive computing to the Apple Computer, Inc. Macintosh, is now bringing its stock to the public. The proposed initial public offering filed earlier this month contemplates an offer of 2 million shares that are priced from $11 to $13 per share.

In the right place at the right time?

Maybe — SCO ups distribution of potential DOS successor, hopes to bypass barriers

BY CHARLES VON SIMSON
CW STAFF

Politeness, and maybe the fact that Microsoft Corp. owns 20% of the company, keeps anyone from saying it out loud, but the feeling at The Santa Cruz Operation (SCO) these days is that OS/2 is finally dead.

Don't blame SCO executives for not wearing black. They make their money in the Unix world. By the end of this month, according to plan, SCO will dramatically broaden the distribution of Open Desktop, its personal computer-based front end to Unix. SCO's executives said they see the system as the logical successor to DOS and an option that could make OS/2 as it exists today a memory over the next five years.

"Open Desktop is like having sliced bread to sell," said Larry Michels, founder and president of SCO. "We are taking a graphical Unix to the lowly PC. We are talking to someone doing computer-aided engineering, or telephone operators or someone with machine tools to run. Here is software that does not require a huge productivity payoff to be cost-effective."

Analysts, however, cautioned that while Open Desktop is a strong product, sliced bread it ain't. "SCO dominates what will be a strong market for Intel-based Unix, but there are a lot of questions about where that market will go," said David Card, Unix analyst at market research firm International Data Corp. (IDC) in Framingham, Mass. "The retail channel hasn't worked for Next, IBM has too much at stake to let OS/2 disappear, and from all indications, SCO still isn't making much money."

CW Chart: Marie Haines

SCO's strategy during the last few years is a case study in the flexibility required to make a go of the treacherous Unix marketplace. For many years, the firm did a strong business in desktop applications, which it still sells. SCO rode its license of Microsoft's Xenix flavor of Unix for PCs. While the firm now only develops maintenance releases of Xenix, sales of the operating system still account for about 60% of operating system sales.

Michels said he expects that figure to drop to 50% by next year and to keep on sliding in favor of the more powerful Open Software Foundation Motif version of Unix that currently accounts for the other 40% of operating system sales. Ultimately, the company's executives think that sales of

Continued on page 97

Cheer and caution mark IBM's second quarter

BY NELL MARGOLIS
CW STAFF

Unfortunately for Kermit the Frog, it probably still is not easy being green. However, in light of IBM's second consecutive upbeat quarterly earnings report last week, it might be a lot easier being Blue.

Particularly strong Application System/400 sales, continuing gains in the leasing area and the beginning of the anticipated payback from corporate restructuring fueled IBM to revenue of $16.5 billion for its second quarter ended June 30 — an 8.4% increase over the sales figure logged for last year's comparable period. Quarterly profits of $1.4 billion marked a 5.2% increase over last year's second-quarter net income.

Favorable currency translation added a shine to the numbers, a spokesman noted. This advantage benefited every firm deriving a hefty chunk of revenue from overseas operations as a weak dollar swelled the gain from foreign sales when stated in U.S. dollars.

On the whole, the numbers exceeded analysts' expectations — although industry analyst Robert Djurdjevic, president of Annex Research, Inc., said the root causes for the encouraging quarterly results were foreseeable and, in fact, foreseen.

"I don't recall any other [IBM] quarter where things have turned out quite as predictably," he said. For example, he and other analysts noted, a 38.5% year-to-year increase in second-quarter rental and financing revenue was not the result of increased second-quarter 1990 leasing activity.

> "I DON'T RECALL any other [IBM] quarter where things have turned out quite as predictably."
>
> ROBERT DJURDJEVIC
> ANNEX RESEARCH

In fact, IBM reported that it wrote fewer operating leases in the quarter just closed than in the comparable quarter last year and slightly fewer than in first-quarter 1990, Montgomery Securities, Inc. analyst John B. Jones Jr. said. Rather, the revenue rolling in reflects the ongoing spoils of the slew of two- to three-year 3380 operating leases written in the second half of fiscal 1989 when IBM deferred shipment of the 3390.

"While first-half results are encouraging, much remains to be done this year," Chairman John Akers said in a prepared statement. IBM similarly warned Wall Street not to "get carried away in [its] estimates," Jones said.

1990 second-quarter earnings

Surprise rise for NCR and continuing strength on the desktop showed in the early reports

Company	Revenue April through June (in millions)	Percent change from 1989	Net income April through June (in millions)	Percent change from 1989
Qume	$57M	1%	($1.83M)	—
Cypress Semiconductor	$53.8M	6%	$8.5M	12%
NCR	$1.6B	5%	$115M	5%
Borland International	$41.1M	78%	$4.6M	192%
Lotus	$175M	33%	$23.5	128%
Conner Peripherals	$303.8M	85%	$26.6M	182%
Intel	$968M	30%	$171M	72%

Parentheses indicate a reduction or loss

CW Chart: Marie Haines

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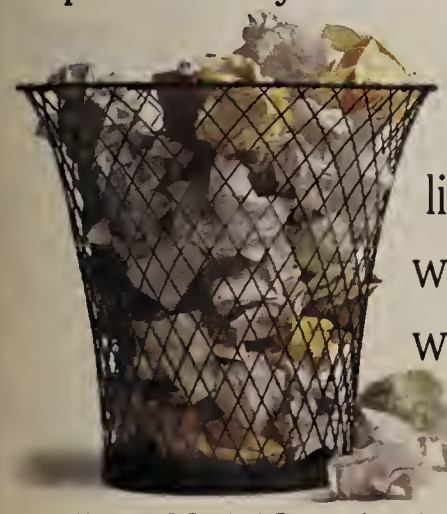

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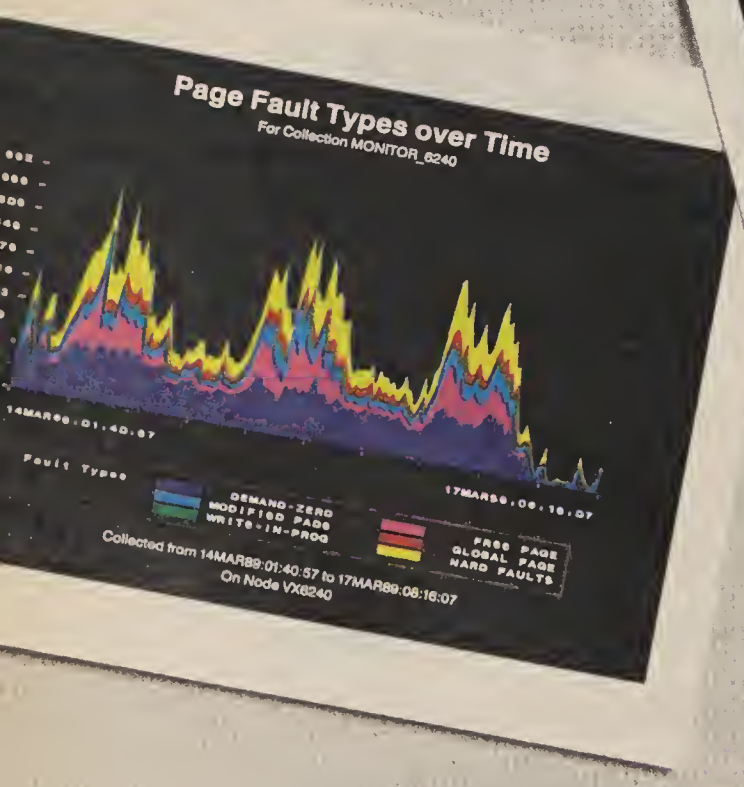

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INTERNATIONAL BRIEFS

First first

Among the latest in the ongoing list of Soviet business firsts: **Alcatel Bell**, the Belgian subsidiary of French telecommunications company **Alcatel N.V.**, has joined forces with Leningrad-based industrial group **Krasnaya Zarya** to give the Soviet Union what could be its first joint venture in the switching equipment arena. The coventurers put together $63 million to launch **Lambell Telephone**, which is owned 60% by its Belgian parent and 40% by its Soviet one. The new firm plans to start producing digital telephone lines in 1995.

■

Second first

Meanwhile, in East Germany, Japan planted its flag in the facsimile niche. Privately owned, Japan-based **Nissei Opto Co.** and **MEI Japan, Inc.** are partnering with Radeburg, East Germany-based **Robotron-Elektronik**, a state-owned electronics firm, to build fax machines in Radeburg. The joint venture, which aims at producing Nissei machines — and creating some 350 jobs — in 1991, would be the first such undertaking by a Japanese firm in East Germany, according to the companies.

■

Variation on the Golden Rule

A plan for breaking up Japanese telecommunications mammoth **Nippon Telegraph and Telephone Corp. (NTT)**, backed by Japan's Ministry of Posts and Telecommunications, is currently on hold, partly in light of a less-than-stellar stock market performance on NTT's part. One onlooker from across the Pacific apparently thinks the plan is right where it ought to stay. Earlier this month, **AT&T** Chairman Robert E. Allen warned Japan to think carefully before doing unto its phone company as his company was ordered to do unto itself. If polled, he reportedly claimed, U.S. phone users would have more bad than good to say about what the AT&T breakup meant to them.

Europe struggling in software

U.S. firms stand to dominate unified packaged software market in 1992

BY RALPH BANCROFT
IDG NEWS SERVICE

LONDON — Unless the European Community acts, U.S. software companies will walk away with the lion's share of benefit from the single European market, according to an executive of Ovum, a market research organization.

Launching its "Ovum 40" list of the leading packaged software suppliers, Ovum Chairman Tim Johnson said that aid should be given to companies that sell exclusively into their respective local national markets to help them build pan-European sales and distribution channels.

"Unless something is done to strengthen the position of European software product companies, it will be the Americans who get all the benefit of the single European market in this area," he said.

Ovum based its Top 40 list on published financial results, stripping out sales of hardware, services and custom software.

According to Ovum's figures, IBM is far and away the largest vendor of packaged software in Europe, with 1989 sales worth $2.12 billion. That figure includes system software (operating systems and utilities) and applications software.

European-based vendors with worldwide marketing operations fared well on the Ovum tally. Second on the the list is Siemens AG in West Germany with 1989 sales of $398 million. West Germany's Nixdorf AG, slated to merge with Siemens in October, ranked third with 1989 sales of $374 million.

ICL, based in the UK, took fourth with sales of $318 million, and France's Bull HN Information Systems, Inc. was fifth with sales of $314 million.

Software sales of $279 million took U.S.-based Digital Equipment Corp. to sixth place on the Ovum ranking, followed

by Italy's Ing. C. Olivetti & Co., which had sales of $236 million. Unisys Corp. was the third U.S.-based company on the list, taking eighth place with sales of $183 million.

Microsoft Corp. and Computer Associates International, Inc. tied for ninth place, each with $152 million in 1989 software sales.

The 40 companies listed — which, in the aggregate, accounted for 64% of European packaged software sales of $11 billion in 1989 — included 21 U.S. companies, six French, five German and four British. Italy, the Netherlands, Finland and Canada accounted for one company each.

"It is not just the number of American companies represented that is significant," Johnson noted. "It is also the fact that almost all the specialist software product suppliers are American."

Most of the European companies on the list are either big hardware manufacturers or systems houses whose main focus is on sales of hardware or computer services rather than packaged software products.

"We are too complacent about Europe's position in the software business," Johnson stated. "It is sometimes said we excel in software and services. But if that's true at all, it is only on the custom software side."

Europe is weak in software products, but its products offer the fastest growth, the biggest profits and the best opportunities for exporting to other parts of the world, Johnson noted.

Bancroft is a European correspondent at London-based IDG News Service.

SCO

FROM PAGE 93

Open Desktop will bring them into the $250 million-per-year range.

"Open Desktop changes the basic economics of this busines," Michels said. "Today, we sell the operating system, but with Open Desktop we have a product to sell to each user on the system. That will dramatically increase the revenue per site that is available to us."

While the company is poised for growth, positioning to get Open Desktop out the door last February caused dramatically slower growth than had been predicted just a few years ago. According to Michels, SCO will have revenue of just over $100 million this year, up from $75 million in fiscal 1989. The company predicted a $100 million year in 1989 and had been doubling in size every year for the past five years.

Open Desktop, the product on which SCO has been focused for the last six months, is a graphical front end that brings a good measure of DOS' ease of use to Unix-based PCs in the $3,000 to $4,000 range. Since 1979, SCO has been the leader in the market for Unix for PCs. While the lack of volume shipment has today slowed developer acceptance of the interface, many analysts said they were confident that it will take off.

Part of that confidence comes from SCO's lock on the Intel Unix market. According to IDC, the company currently commands about 80%; Interactive Systems Corp. has about 10% (including some lucrative deals with large OEMs), and a number of smaller players own the remaining 10%.

One of the PC Unix market segment's largest challenges is the distribution channel. The average PC dealer is not sophisticated enough to sell Unix, and most stand-alone PC users, the heart of the Microsoft Windows market, do not really need it.

Since shipping the product in February, SCO has controlled the number of outlets that could resell the product in an effort to get a better view of how the market would work. After shipping about 4,000 units, a microscopic amount in the scale of PC software, the company will open the product pipeline this month.

SCO will be relying on the likes of its current agreements with Hewlett-Packard Co. and Digital Equipment Corp., under which each of these vendors will resell SCO's Unix and Open Desktop into accounts that request it. The relationships give SCO a lot of sales leverage, but analysts voiced concern that relying too much on that channel may make SCO a second-class citizen in its own accounts.

"DEC wants to sell their own software on Decstations, which may already be their second choice if they can't sell a customer a VAX," Card said. "Open Desktop is not their top priority."

An additional question mark was written into SCO's plans for the coming year by Lotus Development Corp. The Cambridge, Mass.-based vendor hauled SCO into court earlier this month on charges of illegally copying the Lotus 1-2-3 interface for its SCO Professional.

So even while the company fields a decidedly strong product in the ascendant market for PC Unix, executives at The Santa Cruz Operation face a number of tough questions as they attempt to move their company to the next plateau.

3Com charts new networking course

BY PATRICIA KEEFE
CW STAFF

Sometimes you just have to call a spade a spade. In a reversal of last year's annual analyst meeting, at which edgy analysts had 3Com Corp. executives somewhat on the defensive, recently installed President Eric Benhamou took charge from the start this year, laying his cards on the table early.

3Com's new executive team gave notice via a "situation analysis" that it is aware of the challenges it faces. These translate into facts such as "the company's identity, both internally and externally, is unclear" and that "many prevailing perceptions about 3Com are inaccurate."

Some of this can be attributed to a seemingly endless change in focus that has had the company jumping from an emphasis on adapters to network operating systems to client/server technology to systems integration.

This flightiness, coupled with distribution problems, contributed to the company's malaise last year, but despite them, the company has seen a turnabout in its stock value and revenue.

Building momentum

3Com currently has about 2,000 employees, $419 million in sales and $85 million in cash with no long-term debt. Revenue from new products grew from 10% in its first fiscal quarter to 27% in its fourth quarter, which ended in May. Order momentum was up 9% over the previous year.

"They've got a solid balance sheet; they've done a terrific job," said Mary McCaffrey, an analyst at C.J. Lawrence, Morgan Grenfell, Inc. in New York. While 3Com ended fiscal 1990 at 70 cents per share, McCaffrey predicted it will end fiscal 1991 around $1.30 per share.

An improved financial picture has been attributed in part to a clearer sense of identity and purpose — 3Com said its "focus for the '90s" lies in becoming the leading independent, global data networking firm. This will require "a commitment to an open, unbiased approach" to solving customer problems, according to the company.

The "new" 3Com will focus its product development efforts in four areas: adapters, workgroup systems, enterprise systems and support services, according to the company.

Wearing the headhunter hat

Compensation is one consideration for IS pros who switch to recruiting

BY SHERYL KAY
SPECIAL TO CW

After seven years of rising through the ranks to the position of project manager at Electronic Data Systems Corp., Jim Combs felt the need to change direction.

"I was young, impatient and driven," Combs recalls. "I was tired of hearing 'Just hang in there. In five to 10 years you'll get a real management position.' "

For Bob Jensen, 10 years in the information systems organization led to a position as project manager at Boise Cascade Office Products. Then he decided a career change could bring him better compensation, a more flexible schedule and a greater opportunity to shape his future.

Both men took a step that is not uncommon among their fellow IS managers: They turned to the recruiting of computer professionals as a second career.

Steve Joffe, a vice-president at Source EDP, says close to two-thirds of the people the firm hires are IS professionals.

"It took me two days to make the decision," says Combs, now a managing director at Robert Half International, Inc. in Philadelphia. "I've never looked back."

Earning potential is one motive for this kind of move. George R. Martin, now president of his own recruiting firm in Atlanta, learned that lesson in 1977 when he managed corporate systems at Rollins, Inc. A friend with credentials similar to his became a recruiter; after a year, the friend was making three times as much as Martin.

It is not uncommon today for particularly productive IS recruiters to earn six-figure compensation. By contrast, within IS organizations, only vice-presidents and chief information officers average more than $100,000 per year, according to the most recent *Computerworld* salary survey.

Recruiting calls for evening hours because some job candidates can't talk to recruiters while they are at work. To compensate for this requirement, recruiting firms tend to be flexible about the hours their staff keeps; flex time is usually fine for people who are sufficiently productive.

Of course, nothing comes easily. "Recruiting is a sales job," says Jensen, now director at the Rolling Meadow, Ill., office of Source EDP. "Any sales position has its ups and downs. There are a lot of external forces that can affect a placement, not all of which are under your control."

The external forces are wide-ranging: a company might cancel its job requisition; a candidate's spouse might not like something about the job in question; the candidate might get another offer at the last minute.

There is little recruiters can do in this kind of situation. Even when they believe a candidate should take the job they are trying to fill, they may have to wait patiently on the sidelines to avoid the appearance that they put their own interests above those of a job candidate. "The frustration can sometimes be quite intense," Jensen says.

The leap from IS to recruiting isn't as great as some people think. Martin discovered that his 12 years of technical experience helped him a lot. He understood the requirements in job descriptions. He also knew several of the companies he would be placing people with, as well as a lot of qualified candidates.

Combs found his first month as a recruiter frenzied. However, training helped him settle in, and once he placed his first candidate he felt more confident.

The ideal traits for a recruiter include drive, organization, intuition, superior communications skills, a professional manner and honesty. The last item can be particularly important.

Martin has learned that success flows from one's reputation. "If you treat people the way you want to be treated, you'll be a successful recruiter," he says.

IT IS NOT UNCOMMON today for particularly productive IS recruiters to earn six-figure compensation. By contrast, within IS organizations, only vice-presidents and chief information officers average more than $100,000 per year.

Of course, recruiting isn't for everyone — even someone with all these attributes. Cynthia Boaseman, a technical consultant at United Services Automobile Association in San Antonio, spent three months as a recruiter and said it was the worst 90 days of her life.

Several years ago, Boaseman left a technical management position to join a recruiting firm in Austin, Texas. The firm gave her an assignment to recruit someone she knew who was perfectly qualified for the job in question.

However, the job was five states away, and Boaseman felt that the individual was perfectly happy with his current job. She didn't want to encourage him to pick up and relocate his family.

"I felt like I was being used for who I knew," Boaseman says. She started to lose her self-respect, feeling that she might be "conning" one-time acquaintances for her monetary gain. "I'd never do it again," she says.

Other recruiters say they don't want to leave recruiting to return to an IS organization. "I enjoy what I do, it's fun, and I'm successful at it, so why leave a good thing?" Jensen says.

For would-be recruiters who may find themselves yearning for a return to IS work, the ability to make the move back is an issue to consider.

Combs says he thinks the return trip might be difficult, if not impossible: "I've been away from the firing line too long; I'm an antique," he says.

He says that he believes he would lack the technical credibility that someone fresh from an IS department would possess. As a result, he would probably not be able to land a technical position that offers the income he would want.

Kay is a business consultant and freelance writer specializing in emerging technologies and human resources.

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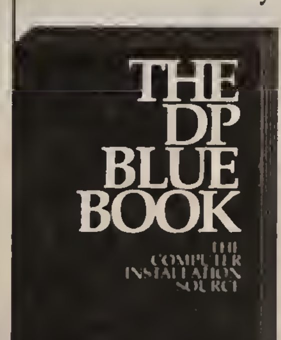

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DEAN

College of Engineering, Computer Sciences and Architecture

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Applicants or nominators should submit a letter summarizing qualifications, a current vita, and the names, addresses and telephone numbers of at least three references to:

Leonard J. Garrett
Chairperson, Dean Search Committee
Computer and Information Sciences
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"Don't buy it, lease it."

Whether this popular advice is sound when acquiring a computer hinges in large part on a company's economic condition. But the decision also depends on how our laws treat purchases and leases. Those seemingly arcane but important differences have been undergoing some significant changes recently.

Although companies sometimes describe a purchase as a lease to get more favorable tax treatment, state contract law sets its own standards for distinguishing a purchase from a lease, and the outcome determines various rights and obligations of the parties.

New standards

The changes in state law have to do with the standards for distinguishing a purchase from a lease. They also establish implied warranties, specify obligations that apply to the lessee's acceptance of the hardware and spell out the lessor's rights in the event a lease is broken.

The changes are contained in an addition to the Uniform Commercial Code known as Article 2A, which essentially rewrites the law of leasing. The Uniform Commercial Code provides a set of standard guidelines for state laws regulating business dealings. Although Article 2A is controversial and its standards have not yet been tested in court, it is expected that in 10 years some form of it will be law in all 50 states.

In general, the difference between a purchase and a lease revolves around who owns the computer and who gets to keep it after the contract expires. In a purchase, the seller transfers ownership of the machine to the buyer in return for a sum of money. Under a "true lease," the lessee operates a machine owned by the lessor in return for rent. The lessee avoids the up-front cost, but like any other renter, he is left only with rent receipts at the end of the lease.

In another kind of lease, known as a "tax lease," the lessee wants to buy the computer and pay for it over a period of time. But the parties describe the purchase as a lease to control the tax impact. They can alter which party claims depreciation and investment credits and how the rent payments are taxed. The lessee can usually buy the computer when the agreement expires by paying a small sum. When tax rates and investment credits are high, tax leases dominate the marketplace.

Even though the parties to this kind of agreement call the transaction a lease for tax purposes, state contract law may treat it as a sale. Today, state law classifies a lease as a sale if the lessee has an option to buy the computer at the end of the lease for payment of a "nominal" price.

For example, if a lessee can buy a $50,000 computer for one dollar after a three-year lease, the lease is a sale under contract law; one dollar for a $50,000 machine is nominal. If the lessee must pay market value for the computer at the end of the lease, the contract is a true lease.

Article 2A considers the transaction a sale under three conditions: if the lessee has the computer for its entire useful life, if it is obligated to pay the rent whether or not it keeps the machine or if the lessee can purchase the machine at a nominal price at the end of the lease.

How would a different classification affect the users and lessors involved in a transaction?

If the transaction is considered a sale, the "lessee" must pay all rent for the full lease even if it returns the computer. If the transaction is a sale, the "lessor" does not own the computer; it is a creditor. As a result, if the "lessee" fails to pay rent, the "lessor" can only foreclose and sell the computer. It cannot simply take back the machine.

Classification as a sale or lease also affects maintenance. Most commercial leases are explicit about which party must maintain the system or provide updates. If a contract is not explicit, however, the classification is important. A seller does not have an obligation to maintain or update a system unless it agrees to do so.

In the case of a true lease, the lessor's obligation to keep the system in shape is an important issue. It involves numerous considerations that result in disputes, including the following:

- Standards of maintenance required.
- Warranties of performance.
- Preconditions that require the lessee to accept the machine and pay rent.
- Requirements for upgrades and the costs they entail.
- Obligations of the lessor regarding programming.
- The rights of the lessee if the system becomes obsolete.

The lessee in a true lease must evaluate each of these aspects of the agreement and deal with them in the contract. Unless the contract spells them out, the rights of the lessee are currently governed by ambiguous and obscure law.

Article 2A changes this situation with its implied warranties, which apply to all leases, and the obligations it imposes on lessees in accepting a computer and on lessors when a lease is broken.

Because the business of distinguishing a true lease from a sale can be an uncertain one today, contracts that approach the line between the two should contain all of the safeguards that the user would want if the transaction were a sale on credit. They should include all the standard warranties and acceptance tests.

Nimmer is Foundation Professor of Law at the University of Houston Law Center.

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Buy/Sell/Lease

The BoCoEx index on used computers

Closing prices report for the week ending July 13, 1990

	Closing price	Recent high	Recent low
IBM PC Model 176	$400	$660	$250
XT Model 086	$500	$700	$350
XT Model 089	$675	$825	$475
AT Model 099	$1,050	$1,375	$850
AT Model 239	$1,075	$1,325	$700
AT Model 339	$1,375	$1,400	$900
PS/2 Model 50	$1,300	$1,700	$1,050
PS/2 Model 60	$2,500	$2,600	$2,400
Compaq Portable II	$1,050	$1,150	$875
Portable III	$2,175	$2,500	$1,900
Portable 286	$1,500	$1,875	$1,300
Plus	$675	$750	$650
Deskpro	$825	$900	$800
Deskpro 286	$1,400	$1,625	$1,300
Deskpro 386/16	$2,500	$2,750	$2,475
Apple Macintosh 512	$375	$775	$275
512E	$450	$450	$350
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II	$3,200	$3,500	$3,050

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Request for Proposal No. 1834, due Tuesday, August 14, 1990 at 3:30 p.m. for the acquisition of hardware, software, installation services, training and technical support for the establishment of a local area network for the Math Department of MERIDIAN COMMUNITY COLLEGE.

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Return-on-investment blues

Look at training value as a business, but from a broad perspective

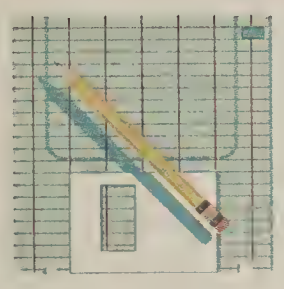
BY WILLIAM SEBRELL
SPECIAL TO CW

I don't view myself as a clairvoyant, but I'm sure that in the near future, senior managers will force training organizations to come up with hard numbers to measure their performance.

Most companies see themselves pursuing one business — financial services, manufacturing or whatever. But with greater competition, more automation and a less-experienced work force, more companies are heavily into the business of training as well. As top executives realize the size of the investments they are approving, they will demand proof that those expenditures are worthwhile.

Companies have used calculations based on the notion of return on investment to come up with the payback from training. In its common form, return on investment is a formula that divides a company's profits, usually for a year, by the value of it assets (excluding people).

Over the years, technical training managers have used this concept to develop two techniques for evaluating their organization's performance. One measure focuses on cost-effectiveness; it divides the quantified benefits or cost savings from training by the cost of the training. The second technique looks at productivity levels. It takes the difference between the productivity of employees before and after training and divides it by the cost of training.



These two techniques can produce some pretty hokey percentages, which is why a lot of companies don't use them. In the first case, identifying benefits is tricky enough; attaching realistic dollar figures to them is even more difficult.

For some types of training, it's relatively easy to demonstrate improvements in performance: An employee couldn't write Cobol code when he was hired but can do so after training. The task is much more difficult for less concrete subjects such as DB2 concepts or writing. In such cases, it's difficult to put improvements in dollars. Some managers point to lower costs for a specific development effort but have difficulty nailing down the portion attributable to training. Managers also cite better performance from the system in question, but the task of quantifying the benefits presents its own problems.

Training managers also contend that their programs lead to reduced turnover. But it's hard to link a change in the turnover rate to training. Also, the cost of turnover is subject to debate.

The second return-on-investment technique also generates its share of arguments and disbelief. First, we rarely have any measure of productivity before training, let alone right after it. Second, the only way to convert the numbers to dollars is to use individual salaries (including overhead). Managers find the resulting figures quite the opposite of the hard numbers for which they are looking.

For both measurements the divisor — the cost of training — is a problem as well. What is the cost of a given course? It certainly includes the compensation of the students while in the class. It includes some piece of the training budget as well as direct costs of the course. But what about lost output while the student is attending the class? What about lost opportunities? All these costs need to be included to provide accurate justification.

Until it is practical to use some form of testing to gauge an individual's performance, it is not useful to chase justification by developing outrageous, unbelievable or unsubstantiated measures of return on investment. A better solution is for management to take a sharp look at training as a business in itself.

This approach calls for using standard performance measures for any activity: history against current performance, comparisons with competitors and performance against plan.

It also requires use of some performance measures developed for business. They cover tasks in administration, operations and strategy.

In administration, the measures should address functions such as production, staffing and organization.

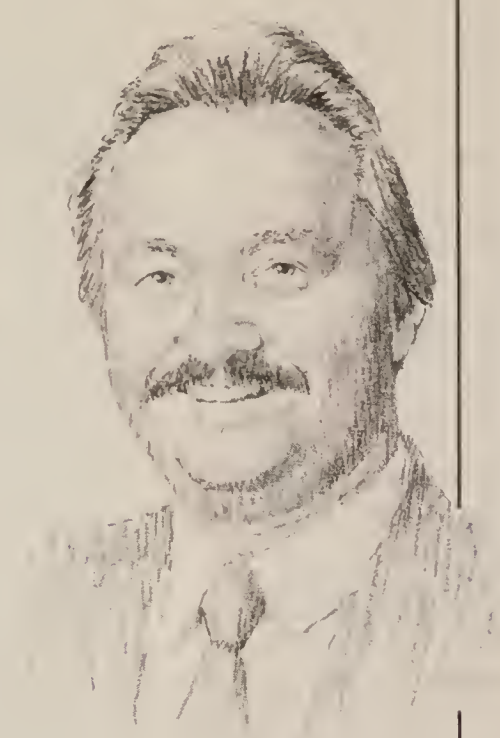
In operations, appropriate measures include the following:

- Liquidity, the ability of training to meet the demands of clients.
- Leverage, the extent to which training uses other resources effectively.
- Activity, the degree to which the department produces and delivers courses.

Strategy is probably the most important consideration. Measurements in this area should address the organization's stage in the training life cycle, its growth in relation to capacity and its reaction to change. The idea is to look at training in relation to future needs.

Any competent training manager can assess the costs of training. It is the worth of the training that we have so much trouble proving. With training costs rising as they are, we need to do more work on ways to measure its impact. We need to put it in terms that senior management will understand and appreciate. We need to relate it to the bottom line.

Sebrell is a vice-president at Data Base Management, Inc., a subsidiary of American Management Systems, Inc. in Manchester, Conn.



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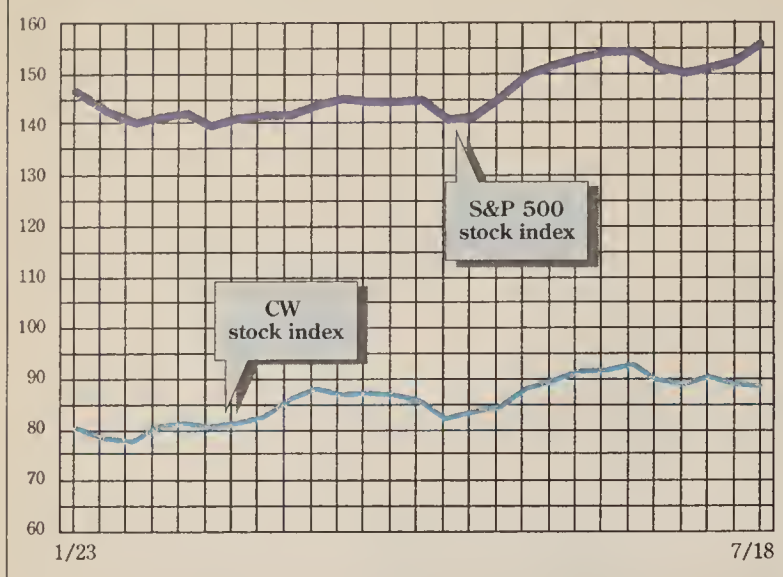
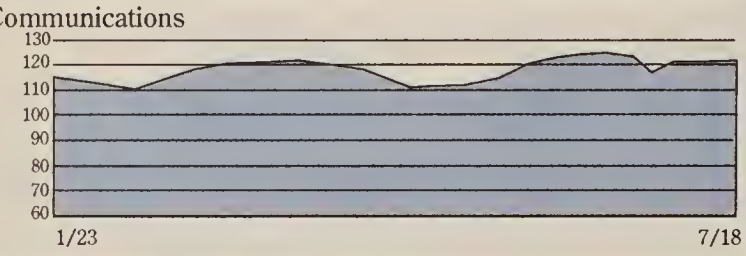
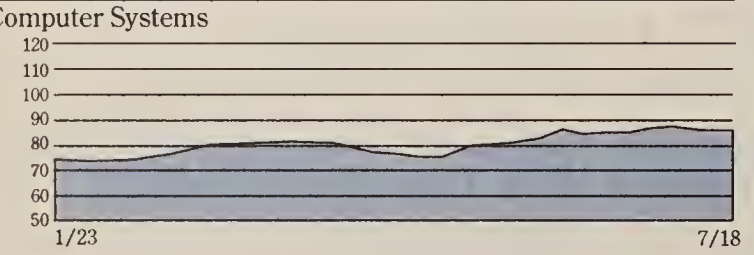


Indexes	*Last Week*	*This Week*
Communications	121.4	**121.5**
Computer Systems	87.0	**87.0**
Software & DP Services	130.0	**127.2**
Semiconductors	61.0	**59.8**
Peripherals & Subsystems	93.3	**96.1**
Leasing Companies	76.4	**75.4**
Composite Index	88.9	**88.5**
S&P 500 Index	152.6	**155.3**

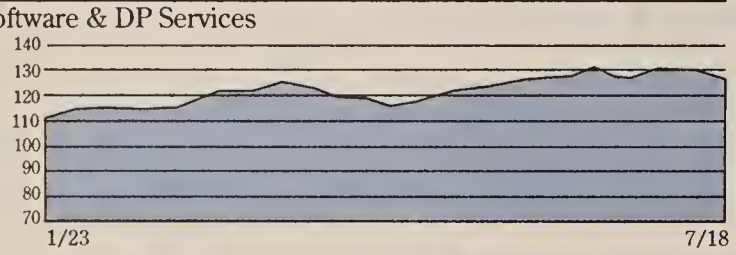
Communications



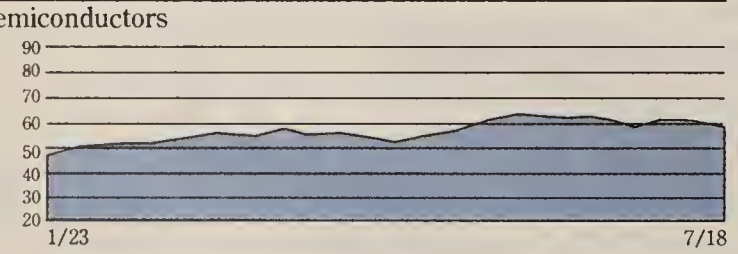
Computer Systems



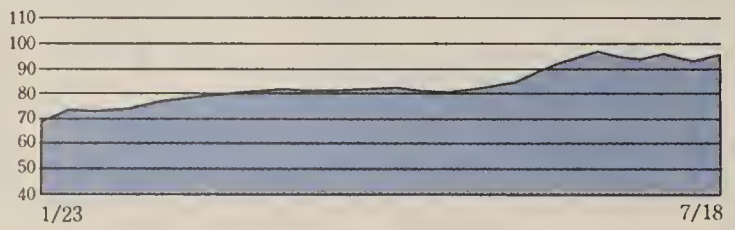
Software & DP Services



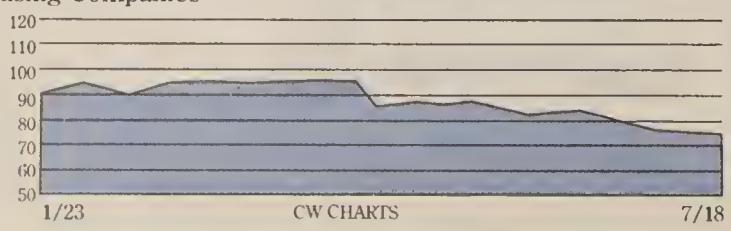
Semiconductors



Peripherals & Subsystems



Leasing Companies



CW CHARTS

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JULY 18, 1990

EXCH		52-WEEK RANGE		PRICE CLOSE JULY 3, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
Communications and Network Services						
N	AMERICAN INFO TECHS CORP	68	55	60.125	0.5	0.8
Q	ANDREW CORP	26	19	22	1.5	7.3
Q	ARTEL COMM CORP	10	4	4.625	-0.3	-5.1
N	AT&T	47	36	37.125	-0.3	-0.7
Q	AVANTEK INC	7	2	3.25	0.3	8.3
N	AYDIN CORP	21	13	14.5	0.0	0.0
N	BELL ATLANTIC CORP	57	43	45.375	-1.1	-2.4
N	BELLSOUTH CORP	59	49	52.5	1.9	3.7
Q	COMPRESSION LABS INC	16	7	14	-2.1	-13.2
Q	CONTEL CORP	37	23	33.25	5.3	18.8
Q	DATA SWITCH CORP	4	2	3.5	0.1	3.7
Q	DIGITAL COMM ASSOC	27	17	25.5	1.8	7.4
Q	DYNATECH CORP	21	15	16.25	0.1	0.8
Q	FIBRONICS INTNL INC	13	5	11.75	-0.1	-1.1
Q	GANDALF TECHNOLOGIES	7	2	3.375	-0.4	-10.0
N	GENERAL DATACOMM INDS	7	3	4	0.1	3.2
N	GTE CORP	36	28	27.875	-3.1	-10.1
Q	INFOTRON SYS CORP	11	3	3.5	-0.3	-6.7
N	ITT CORP	65	51	58.625	0.8	1.3
N	M A COM INC	8	3	4.875	0.0	0.0
Q	MCI COMMUNICATIONS CORP	49	31	36.5	-3.5	-8.8
N	NETWORK EQUIP TECH INC	34	8	8.75	0.5	6.1
Q	NETWORK SYS CORP	15	7	14.625	0.1	0.9
N	NORTHERN TELECOM LTD	30	19	28.375	-0.5	-1.7
Q	NOVELL INC	59	24	55	-1.3	-2.2
N	NYNEX CORP	92	75	78.125	-1.6	-2.0
N	PACIFIC TELESIS GROUP	52	41	43.125	0.9	2.1
A	PENRIL CORP	9	4	8.625	0.1	1.5
N	SCIENTIFIC ATLANTA INC	29	19	28.375	-0.1	-0.4
N	SOUTHWESTERN BELL CORP	65	51	53.875	2.0	3.9
Q	3 COM CORP	19	10	17.125	-0.6	-3.5
N	U S WEST INC	41	33	36.25	0.4	1.0
Computer Systems						
Q	ALLIANT COMPUTER SYS	9	4	5.5	0.1	1.1
Q	ALPHA MICROSYSTEMS	8	2	2.375	-0.1	-5.0
Q	ALTOS COMPUTER SYS	8	5	8.25	0.0	0.0
A	AMDAHL CORP	19	11	17.75	-0.4	-2.1
Q	APPLE COMPUTER INC	50	32	44.625	-2.4	-5.1
N	BOLT BERANEK & NEWMAN	9	4	4.875	-0.3	-4.9
N	COMPAQ COMPUTER CORP	68	37	64.375	-0.1	-0.2
N	COMMODORE INTNL	13	6	7.25	-0.5	-6.5
N	CONTROL DATA CORP	23	16	19	0.1	0.7
N	CRAY RESH INC	51	31	47.625	0.3	0.5
N	DATA GEN CORP	19	8	10	-0.6	-5.9
N	DATAPOINT CORP	6	2	2.375	-0.1	-5.0
Q	DELL COMPUTER CORP	14	5	13	-0.6	-4.6
N	DIGITAL EQUIP CORP	103	70	83.5	-3.1	-3.6
N	FLOATING POINT SYS INC	4	0	2.625	-0.4	-12.5
N	HARRIS CORP	40	28	34.125	1.4	4.2
N	HEWLETT PACKARD CO	58	40	47.5	0.3	0.5
N	HONEYWELL INC	112	73	109.625	5.1	4.9
N	IBM	123	93	119.875	0.8	0.6
Q	INFORMATION INTL INC	16	12	13.25	0.5	3.9
Q	IPL SYS INC	14	5	11.75	0.3	2.2
N	MAI BASIC FOUR INC	6	2	1.875	-0.1	-6.3
N	MATSUSHITA ELEC INDL LTD	180	123	147.688	3.4	2.4
Q	MENTOR GRAPHICS CORP	26	14	17.75	-0.8	-4.1
N	NBI INC	3	0	0.281	0.0	-10.2
N	NCR CORP	72	55	70.875	6.6	10.3
Q	PYRAMID TECHNOLOGY	36	11	29.25	0.5	1.7
Q	SEQUENT COMP SYS INC	34	13	30.5	-0.5	-1.6
Q	SUN MICROSYSTEM INC	37	13	34.75	-0.8	-2.1
Q	SYMBOLICS INC	2	0	0.5	0.2	59.7
N	TANDEM COMPUTERS INC	30	19	21.5	-2.4	-9.9
N	TANDY CORP	49	30	38.875	1.9	5.1
N	ULTIMATE CORP	11	5	7	-0.4	-5.1
N	UNISYS CORP	24	12	12.625	-0.6	-4.7
A	WANG LABS INC	7	4	4.25	-0.1	-2.9
Software & DP Services						
Q	AMERICAN MGMT SYS INC	20	11	18.875	1.1	6.3
Q	AMERICAN SOFTWARE INC	27	14	23	-2.5	-9.8
N	ANACOMP INC	7	2	2.625	-0.1	-4.5
Q	ANALYSTS INTL CORP	24	14	21.5	-1.3	-5.5
Q	ASHTON TATE	18	9	10.375	-1.4	-11.7
Q	ASK COMPUTER SYS INC	15	7	9.25	-0.9	-8.6
N	AUTO DATA PROCESSING	60	40	59	2.6	4.7
Q	AUTODESK INC	60	33	57.5	-1.0	-1.7
Q	BMC SOFTWARE INC	30	14	27	-1.3	-4.4
N	BUSINESSLAND INC	14	7	7.625	-0.3	-3.2
Q	COGNOS INC	10	4	9.5	0.5	5.6
N	COMPUTER ASSOC INTL INC	20	9	9.5	-7.0	-42.4
Q	COMPUTER HORIZONS CORP	17	7	16.75	2.3	15.5
N	COMPUTER SCIENCES CORP	59	40	44	-0.8	-1.7
N	COMPUTER TASK GROUP INC	14	9	10.25	0.0	0.0
Q	COMSHARE INC	25	15	22.75	-1.0	-4.2
Q	CORPORATE SOFTWARE	15	8	15.25	2.0	15.1
N	GENERAL MTRS (CLS E)	38	24	36	-1.5	-4.0
Q	GOAL SYSTEMS INTL	18	10	15	0.0	0.0
Q	HOGAN SYS INC	7	4	3.875	0.3	6.9
Q	INFORMIX CORP	18	8	14.625	-2.1	-12.7
Q	INTELLICORP INC	8	3	5.5	-1.6	-22.8
Q	LEGENT CORP	32	19	24.75	-0.3	-1.0
Q	LOTUS DEV CORP	39	21	31.25	-1.3	-3.8
Q	MICROSOFT CORP	81	26	76	0.5	0.7
Q	NATIONAL DATA CORP	35	13	14.25	-0.8	-5.0
N	ON LINE SOFTWARE INTL INC	11	6	8.25	-0.3	-2.9
Q	ORACLE SYS CORP	188	15	17.75	-2.1	-10.7
N	PANSOPHIC SYS INC	19	10	13.125	-0.6	-4.5
Q	PHOENIX TECHNOLOGIES INC	7	2	4	-0.3	-5.9
N	POLICY MGMT SYS CORP	43	30	43.375	1.5	3.6
Q	PROGRAMMING & SYS INC	25	16	22	-1.5	-6.4
Q	RELATIONAL TECH INC	11	5	5.75	-0.6	-9.8
N	REYNOLDS & REYNOLDS CO	27	19	20.875	0.8	3.7
Q	SAGE SOFTWARE INC	16	7	15.25	1.9	14.0
Q	SEI CORP	22	15	20.5	-1.0	-4.7
Q	SHARED MED SYS CORP	17	12	12.875	0.1	1.0
Q	SOFTWARE PUBG CORP	28	13	27	3.0	12.5
N	STERLING SOFTWARE INC	11	7	10.375	0.3	2.5
Q	SUNGARD DATA SYS INC	26	17	25.25	1.0	4.1
N	SYSTEM CENTER INC	26	17	17.375	-0.5	-2.8
N	SYS. SOFT INC	29	15	25.25	-1.3	-4.7
Q	WORDSTAR	2	1	1.063	0.0	-2.8
Semiconductors						
N	ADV MICRO DEVICES INC	11	7	9.125	-0.3	-2.7
N	ANALOG DEVICES INC	11	7	7.25	0.0	0.0
Q	ANALOGIC CORP	11	8	9.375	0.1	1.4
Q	CHIPS & TECHNOLOGIES INC	26	15	19.5	-2.0	-9.3
Q	INTEL CORP	52	28	48.5	0.5	1.0
Q	MICRON TECHNOLOGY INC	17	7	12	-1.1	-8.6
N	MOTOROLA INC	88	53	85.875	-0.5	-0.6
N	NATL SEMICONDUCTOR	9	5	6.875	0.0	0.0
N	TEXAS INSTRS INC	44	28	38.875	-0.3	-0.6
A	WESTERN DIGITAL CORP	15	6	13.375	-0.4	-2.7
Peripherals						
Q	ALLOY COMP	2	0	0.688	0.0	0.0
N	AM INTL INC	6	2	2.5	0.0	0.0
Q	AST RESH INC	26	7	25.5	0.0	0.0
Q	AUTO TROL TECH CORP	5	2	3.375	0.1	1.9
Q	BANCTEC INC	24	13	21.75	1.5	7.4
A	COGNITRONICS CORP	8	3	5.75	-0.1	-2.1
Q	CONNER PERIPHERALS	31	10	30.25	2.5	9.0
A	DATARAM CORP	22	8	19.75	-1.1	-5.4
N	EASTMAN KODAK CO	52	36	40.75	0.9	2.2
N	E M C CORP MASS	7	3	6.125	0.6	11.4
Q	EMULEX CORP	9	4	8	0.9	12.3
Q	EVANS & SUTHERLAND	35	18	28.5	0.8	2.7
Q	ICOT CORP	2	1	1.5	-0.1	-7.7
Q	INTERLEAF INC	9	5	6.75	0.1	1.9
Q	IOMEGA CORP	6	3	5.688	-0.1	-1.1
Q	LEE DATA CORP	3	1	1.5	0.1	9.1
Q	MASSTOR SYS CORP	4	1	1.313	0.3	23.5
Q	MAXTOR CORP	17	7	14.375	-0.5	-3.4
Q	MICROPOLIS CORP	10	3	10.125	2.3	28.6
N	MINNESOTA MNG & MFG CO	91	68	89.75	0.3	0.3
Q	PERSONAL COMP PRODUCTS INC	5	4	4.063	0.1	3.2
Q	PRINTRONIX INC	15	7	11.75	-1.4	-10.5
N	QMS INC	21	9	19.125	0.4	2.0
Q	QUANTUM CORP	25	9	24.5	-0.4	-1.5
N	RECOGNITION EQUIP INC	10	4	5.25	0.0	0.0
Q	REXON INC	10	6	7.375	0.0	0.0
Q	SEAGATE TECHNOLOGY	20	10	14.25	0.3	1.8
N	STORAGE TECH CORP	35	9	34.5	1.9	5.7
Q	TANDON CORP	4	0	3.313	-0.5	-13.1
N	TEKTRONIX INC	23	12	16.125	0.3	1.6
Q	TELEVIDEO SYS INC	1	0	0.375	0.1	19.8
N	XEROX CORP	69	44	47.875	2.9	6.4
Leasing Companies						
N	CAPITAL ASSOC INTNL INC	8	3	2.75	-0.1	-4.3
N	COMDISCO INC	34	17	18.375	0.3	1.4
Q	LDI CORPORATION	18	13	15.25	-0.5	-3.2
Q	PHOENIX AMERN INC	5	3	3.688	0.2	5.4
Q	SELECTERM INC	9	5	5.125	0.0	0.0

EXCH: N=NEW YORK; A=AMERICAN; Q=NATIONAL

Heat rash

No fun in the sun for tech firms after releasing earnings figures

The heat is on — and not just because of the summer sun. Earnings report time can produce sweat on even the coolest of executive brows. That said, the power brokers at some technology firms must have gone through no small number of super-absorbent hankies last week.

Among the larger losers was Lotus Development Corp. Although officials at Lotus reported substantial earnings gains for the quarter, the company's stock still plunged 7⅝ points to close Thursday at 25⅛.

Dire financial reports from United Telecom, Inc., including a loss at its U.S. Sprint Communications Co. unit, set United Telecom stock back a whopping 11⅜ points to 27¾. MCI Communications Corp. also suffered, losing 1⅝ points to 37⅞, while AT&T gained ½ of a point to close at 37⅝.

NCR Corp. was one of the few technology issues to come out ahead last week, and it did so by a mile, picking up a cool 6⅛ points to end at 71 after posting positive figures for the quarter.

For others, however, earnings news did indeed set off a round of sell-offs (see stories pages 8 and 93). Despite quarterly gains, Apple Computer, Inc. fell 5 points to 41¾, and Intel Corp. gave up 2¼ points to 47¾. Ashton-Tate Corp. slipped 2⅛ points to 9½ on news of a quarterly loss. IBM reported increased profits but saw a 1-point decrease in its stock price to 120.

Elsewhere, Digital Equipment Corp. dropped 1⅝ points to 82⅞. Sun Microsystems, Inc. slid 2⅝ points to 34, while Compaq Computer Corp. fell 2⅞ points to 63½. Novell, Inc. lapsed 3½ points to 54¼, and Microsoft Corp. declined 1⅝ points to 76¾.

KIM S. NASH

Unions

FROM PAGE 1

main training centers — one each for Chrysler Corp., Ford Motor Co. and General Motors Corp. The UAW sites, called the National Education, Development and Training Centers, are financed by the auto makers and co-managed with the union. "The company has resources that we don't have," Fraser said. Computer skills is the most popular offering.

While some of the joint project's training is offered to employed members during work hours, most unions can only negotiate for computer skills to be developed during workers' off hours or after members have been laid off.

Promoting training

AT&T, which has laid off thousands of union workers in the last two years, established a training center with the International Brotherhood of Electrical Workers and the Communications Workers of America. The Alliance for Employee Growth and Development, Inc., based in Somerset, N.J., teaches a variety of computer and other job skills including Unix, X.25, networking and C programming.

More than 30,000 people have used the training in the past year, according to Ken Ross, the co-executive director appointed by AT&T. He said that the high number — compared with 20,000 the previous year — was only partially a result of layoffs. Ross said that workers will often not develop new skills unless they are forced to. "Unless there's some pain in the system, not much changes. Layoffs have caused people to look to enhance skills," he said.

Instead of using technology training to resuscitate members whose skills are being passed by, the pilots and machinists unions have embraced technology to further the goals of their unions as well as to keep members abreast of computer skills.

"We're trying to provide the same information to our members that management has," said Bob Kalaski, director of communications for the machinists union.

By integrating technology into its overall operating scheme, the machinists attempt to direct which systems its members will use, instead of the above cases in which management either picks the technology on which workers will be trained, or workers employ the scattershot approach, choosing courses and hoping their skills will be applicable to new technology.

"Technology presents a choice," said Don Kennedy, educational representative for the machinists union at the Placid Harbor Education & Technology Center in Hollywood, Md. "It can be exercised alone by management, or it can be exercised jointly. If the choice is jointly made, unions and workers will embrace technology."

Kennedy said the first thing he teaches members to do is find out how their employer plans to implement technology. Then they develop their own plan — in which technology can make the company more efficient without costing jobs.

In its alternative technology program, the union attempts a long-term business plan and specifies the types of systems they want used. "Most often, the company people are looking at the bottom line in the short run," Kennedy said. By projecting long-range markets, the union hopes to avoid making wage and benefit agreements with employers that eventually lose market share and shut down, leaving workers without jobs.

Kennedy estimated that one-third of employers cooperate with his union in implementing technology; another third say, "It's none of your damn business"; and the rest are "small employers who don't understand the need to bring in technology to keep them competitive."

The machinists union is apparently the only large union that aims to use technology on the union's terms, hoping to convince employers to join with them. Joint agreements such as the UAW's are more likely to educate members on the systems used by employers and thus have more direct benefit, according to Irving Bluestone, professor of labor studies at Wayne State University in Detroit.

Computer literate

Unlike workers in other labor unions, members of the pilots union are already well-versed in computers. Their union has established services for members to access information about new technologies as well as to facilitate communications and negotiations with employers.

In 1985, the union had a skeletal bulletin board-style communications system set up. "We wanted to test it under fire. Little did we know a fire was [already] brewing," said Jim Barnett, director of information systems and services for the union in Herndon, Va. That fire was a strike against United Airlines.

Using home computers or computers at 10 union offices, members could find the latest information within minutes of it occurring, from picket lines to press releases.

Now in its third version, the bulletin board offers members technical information as well as shareware to analyze contracts and tools to manipulate data.

The pilots union has a relatively wealthy and steady membership to allow it to cope with the expensive prospect of keeping up with technology. At the other extreme is the Printing, Publishers and Media Workers Sector of the Communications Workers union.

"It's definitely hurting us," said Dave Gray, assistant to the president. That union, primarily comprised of typesetters, has one-third the members it had in the mid-1980s, before computerized printing and desktop publishing became common.

Declining membership caused it to merge with the Communications Workers two years ago.

The union does not train its members in desktop publishing or computer printing operations because it does not have the resources. "We used to, but new technology came so fast that we, as a union, couldn't afford to keep up with computers. You buy one, and six months later it's obsolete," Gray said.

Nearly every union, even the typesetters, claimed they have never resisted technology. But at least one organization that was vociferous in its crusade against office automation has come full circle and now offers training in computer use.

In 1982, 9 to 5, the National Association of Working Women, crusaded against office automation, telling Congress that unless it intervened, office automation would cause "irreparable harm to office workers' jobs, health and quality of working life."

In 1988, it began what it called the Job Retention Project for displaced clerical workers.

Union offices on trailing edge

BY J. A. SAVAGE
CW STAFF

By leading-edge standards, labor union offices are still in the Dark Ages when it comes to implementing current technologies such as networking or electronic data interchange, and many still have no office automation.

In the AFL-CIO, however, there is a new movement to push automation for efficiency into member locals. Called Labortech, the movement was launched by 14 union locals in California in May.

"The rank and file are very open to making the [International Association of Machinists and Aerospace Workers] union high-tech. They would question our effectiveness if we weren't trying," said Dennis Hitchcock, a Labortech organizer.

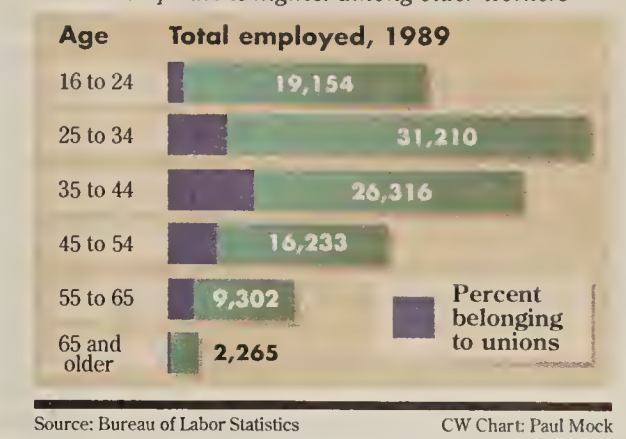
The Machinists union is one of the more computer-savvy unions. So far, about half the locals now use computers to some extent, according to Jim Moran, a systems analyst at the union's international office in Washington, D.C.

The union will provide its custom software to any local, although locals must purchase their own hardware, according to Moran. Locals also have to send their floppy disks to the international for updates on the mainframe.

"We're looking into doing it through phone lines and client/server architecture," Moran said.

Aging union label

Membership rate is highest among older workers



Source: Bureau of Labor Statistics — CW Chart: Paul Mock

Mixed blessing

In other union offices, desktop publishing has been a boon to intraunion communication, although it has put its share of union members out of work. "It was a real tough decision to go to desktop publishing," said Bob Kalaski, director of communications at the Machinists' international.

"A few years ago, when we moved into it, we were still setting hot type," he said, referring to the old method where hot lead formed an impression of each letter for printing. Hot type was replaced by a photographic process called cold type, which is in turn being replaced by computerized typesetting. "I sat down with our printer and said that I have a commitment to be as efficient as possible to my members and management," he said.

Because computers have replaced workers, some union officials appear understandably reluctant to embrace technology.

While not following an official policy, the California Labor Federation, AFL-CIO, is loath to implement computers in its own office because of the personal resistance of its president, Jack Henning, according to union staffers. Henning did not return *Computerworld's* phone calls.

"We're an old-fashioned office," said Floyd Tucker, editor of the union's newsletter. Although there are four stand-alone computers in the office for word processing and bookkeeping, the office has eschewed desktop publishing.

"Leadership is going to have to be made more secure," said Hitchcock, who is editor of the Machinists union local newsletter for workers in the San Francisco airport area.

"There's the element of control — the international organizations are concerned about the locals using technology, and one way of controlling the unions is to control the level of information available," Hitchcock said.

Low-tech

Bringing in a new personal computer for word processing or spreadsheets is not a clear-cut business decision for an office whose "pink collar" staff is represented by the Office and Professional Employees union.

Most sensitive to the effect of computers on their clerical work force are likely to be the union offices themselves, which in turn hire union-organized office workers. If, for example, a union local such as the International Association of Machinists and Aerospace Workers at the San Francisco airport wants to bring in a new computer for its office staff, its contract with the office union must be renegotiated.

Most contracts only require negotiations when an office is first computerized, with ongoing contract clauses to prevent layoffs of senior personnel who may be unfamiliar with computers and to accommodate training, according to Kitty Simmons, a business representative at the office union's Local 30 in San Diego. But some, like the machinists union local, have to negotiate over each new computer.

"It would be ludicrous to defy automation, but it creates a greater demand on people, and we have to negotiate for the increased worth of the work," said Gwen Newton, secretary-treasurer at the office union in Los Angeles.

NEWS SHORTS

Copyright hearing set for fall

U.S. District Judge Robert Keeton said he will hold a Nov. 12 hearing on damages in the *Lotus Development Corp.* v. *Paperback Software International, Inc.* suit, after which he will issue a permanent injunction and award damages to Lotus. Last month, Lotus won a copyright infringement suit against Paperback. "The judge has to finish his work on the case before Paperback can appeal," said a Lotus spokesman. Keeton also set Oct. 25 as the opening date of a similar Lotus suit against Mosaic Software, Inc.

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CA adds Datacom/DB for micros

With an eye toward downsizing, Computer Associates International, Inc. took the wraps off a personal computer version of its Datacom/DB database management system last week. In addition, the company enhanced the PC version of its IDMS DBMS. Release 2.3 of IDMS/PC is now completely compatible with the mainframe version, the company said. IDMS/PC is slated to be available in the third quarter and Datacom/DB/PC in the fourth. Prices for single workstation versions of both will start at about $4,800.

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Sequoia, Samsung strike deal

Sequoia Systems, Inc., a computer manufacturer based in Marlboro, Mass., announced a two-part marketing and development agreement with Samsung Electronics Co. last week. Under the agreement, Samsung will be the sole OEM in South Korea for Sequoia's existing Series 300 fault-tolerant computer system. Samsung will also pay for the development of a new low-end Unix-based computer to be called the Series 40, based on Pick, Sequoia's multiprocessor architecture. The future machine will be based on Motorola, Inc.'s 68040 microprocessor and is expected to be completed by the first quarter of 1992. The machine will be marketed under the Samsung name in South Korea and under the Sequoia name elsewhere.

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Symphony on the road

Lotus Development Corp. shipped the server and node editions of Symphony 2.2, the company's integrated desktop package, last week. A stand-alone version of Symphony 2.2 had shipped previously. The server edition is licensed for shared use from a central file server and includes a local-area network administrator's guide, documentation, a license for one network user and software in both 5¼- and 3½-in. media. Suggested retail is $895. The node edition costs $595 and provides for an additional concurrent Symphony user on the network. It includes a single license for network use and documentation. Users who purchase server and node editions of Version 2.0 until Aug. 16 can receive free upgrades of 2.2 counterparts until Dec. 31.

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Timeplex takes T1 to Taiwan

Timeplex, Inc. announced last week that Taiwan Telecommunications Network Services Co. (TTN), a private carrier, has contracted to install 21 Timeplex Link/2+ multiplexers in 16 cities. The multiplexers will reportedly allow the carrier to offer high-speed digital access to users who cannot justify the cost of a full T1 (1.5M bit/sec.) link, which is the only increment currently available from the Taiwanese public telecommunications authority. TTN will lease the full T1 pipe from the public carrier and divide it into increments as small as 9.6K bit/sec. In the U.S., fractional T1 is available in 64K bit/sec. chunks, although dedicated leased-line alternatives at the slower speeds are also available.

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AT&T chips serve 10Base-T

AT&T Microelectronics announced last week that it is shipping a three-chip product set that complies with the latest version of the nearly complete IEEE 10Base-T standard for running 10M bit/sec. Ethernet networks over unshielded twisted-pair wiring rather than coaxial cable, which is specified in the original Ethernet standard. The three chips consist of a twisted-pair medium attachment unit, twisted-pair port receiver and multiport repeater.

Fujitsu aiming to purchase ICL

BY AMIEL KORNEL
and NELL MARGOLIS
CW STAFF

In the most brazen move yet made on the European market by a Japanese computer maker, Fujitsu Ltd. is negotiating to buy a controlling interest in the UK's biggest domestic computer manufacturer, International Computers Ltd. (ICL).

The two companies last week confirmed that negotiations are under way, following a report to that effect in Thursday's *Financial Times.* Analysts last week estimated the deal as potentially worth $907 million to $1.63 billion.

Fujitsu's move to acquire ICL, analysts said, could set off a spree of cross-border mergers and acquisitions in the European computer industry.

"This may speed up the rationalization of the computer industry in Europe," said Charles Burrows, a London-based analyst at stock brokerage James Capel & Co. "Everyone was talking about it before; maybe now they'll be spurred into action."

Peter Labe, an analyst at Labe, Simpson & Co., said he did not view the action as foreshadowing a more aggressive assault by Fujitsu on the U.S. mainframe market, possibly through Amdahl Corp., in which it now holds a 44% stake. "That's over — that's last year's news," he said, referring to past speculation of such a move.

However, the acquisition would immediately rocket Fujitsu into the second place in the UK computer market. "Fujitsu's target is to contain IBM," said Peter G. Wolff, vice-president of Kidder, Peabody International Corp. in Tokyo.

The deal would turn the UK computer market into something of a foreign preserve before the opening of the united European market in 1992. This spring, UK-based personal computer maker Apricot PLC was purchased by Japanese giant Mitsubishi Electric Corp. IBM, West Germany's Siemens AG, Digitial Equipment Corp., Unisys Corp. and France's Groupe Bull are major players in the UK market.

European manufacturers have suffered rough times in the past two years as foreign competition heated up in what has truly become a global industry. Italy's Ing. C. Olivetti & Co., N.V. Philips in the Netherlands, Norway's Norsk Data A/S and Sweden's Nokia Data A/S are all having trouble staying profitable. Nixdorf AG, the troubled West German minicomputer maker, is being aquired by Siemens AG.

The Japanese have traditionally maintained a low profile in Europe, hoping to avoid roiling the fiercely nationalistic Europeans. But the lure of Europe's increasingly lucrative market seems to be removing that hesitancy.

ICL, a subsidiary of telecommunications equipment maker STC Ltd., accounts for 60% of its parent company's revenue and about 55% of its profits. Sales of $2.195 billion last year placed ICL ninth among European vendors. Profits were $237 million or nearly 11% of sales.

An ICL spokesman said the deal was necessary because the company, which derives some 50% of its revenue from mainframes manufactured at a highly automated plant, could not support the massive research and development cost required to keep it competitive.

Lori Valigra, Tokyo bureau chief for the IDG News Service, contributed to this report.

Protesters to march against 1-2-3 suit

BY MICHAEL ALEXANDER
CW STAFF

CAMBRIDGE, Mass. — The League for Programming Freedom is on the march again, with plans to demonstrate in front of Lotus Development Corp.'s headquarters Aug. 2.

The group opposes attempts by software publishers such as Lotus, which is trying to copyright the look and feel of 1-2-3, its best-selling spreadsheet. Last month, Lotus won a lawsuit against Paperback Software International, Inc. and filed new lawsuits against Borland International and The Santa Cruz Operation.

Dire threat

Lotus' courtroom victory set a precedent that threatens to bollix up the entire software industry, said Richard Stallman, who in May 1989 led a similar march on Lotus and founded the league in October with Chris Hofstader and Denis Filipetti. Stallman, who recently received a coveted MacArthur Foundation Award (see story at right), and Hofstader are programmers; Filipetti is a consultant.

Other league members include MIT Professor Marvin Minsky, founder of MIT's Artificial Intelligence Laboratory; Stanford University Professor John McCarthy, inventor of the LISP computer language; and University of Texas Professor Robert Boyer, co-developer of the Boyer-Moore fast string search technique and a researcher in computer theorem proving.

"It's like copyrighting the layout of keys on a typewriter," Stallman said. If new typewriter manufacturers had to design different layouts, hardly anyone would buy a nonstandard typewriter, even if it was superior, he added.

Many hundreds of protestors are expected to walk a picket line and listen to speeches by Stallman and MIT Professor Patrick Winston, director of the Artificial Intelligence Lab, Stallman said.

Lotus officials do not plan to meet with the protesters or "participate in any way in their event," a Lotus spokesman said. "They are entitled to pursue their rights while Lotus pursues its rights."

Path to freedom

Richard Stallman, one of the organizers of next week's Cambridge, Mass., demonstration in front of Lotus, has long been recognized for his unconventional views on computer software.

Two weeks ago, those views earned him a $240,000 fellowship from the MacArthur Foundation of Chicago, an annual award to gifted people from all walks of life.

"I believe that software ought to be free," Stallman, 37, said last week. He is the developer of Emacs, a widely used programming editor, and is currently working on a Unix-compatible operating system called Gnu.

Stallman is also founder of the Free Software Foundation and co-founder of the League for Programming Freedom.

This year's recipients of the MacArthur Foundation Awards will receive from $150,000 to $375,000 over five years and can spend the money as they choose. Other winners this year include a choreographer, photographer and farmer, as well as academics from several fields of study.

MICHAEL ALEXANDER

Downsizing

FROM PAGE 1

department or the entire organization," Winsberg said. "They often can't come to grips with the issues of standardization, access and network management across the enterprise."

The same issues that end-user departments are grappling with are the ones that IS professionals handle best, said Tyler Band, a systems integration consultant at Vanguard Business Solutions, Inc., which assisted in downsizing projects at Eastman Kodak Co. and TRW, Inc.

"Issues like security and high-performance networks were solved on the mainframe for the last 20 years," Band said.

One obvious way to bridge the knowledge gap, Band said, is for IS staffers to team with the PC developers, many of whom work in the business units far from the central computer room.

It is the promise of a client/server architecture, in which PCs or workstations share the processing tasks with powerful local-area network servers, that is enticing many businesses to think about downsizing.

"PCs and workstations with from four to 15 MIPS are emerging that are aggressively moving into the minicomputer range," said conference chairman George Schussel, president of Digital Consulting, Inc. in Andover, Mass. "Now you can get serious, industrial-strength software to run on those PCs and do the jobs only mainframes and minis could do until now."

Just the beginning

After years of debate, key products that could deliver distributed database solutions are only beginning to be shipped. These enabling products include network management systems from IBM and AT&T, fourth-generation application generators and a wide variety of relational database management system computer-aided software engineering (CASE) tools.

Many users at last week's conference said they are unsure about the dozens of new client/server products that have appeared on the market during the last two years. Some said they were confused about the relative merits of many vendors' claims about the products. "I'm shopping around for products that support OS/2 applications," one California user said. "So far, I'm not sure which ones work with OS/2 and which don't."

Even when users understand the products, distributed applications must be planned carefully, or they will not deliver the desired functionality, others said.

"Users must learn to analyze their systems without regard to the particular products involved," Winsberg said.

Some organizations, including Levi Strauss & Co. in San Francisco, stress the importance of planning and analyzing before writing a single line of code. However, Winsberg said he believes Levi's CASE process is unusual, adding: "I believe that not more than 10% of MIS organizations have a feel for what that kind of analysis is all about."

The technology itself must be put together in a cohesive way, argued Richard Finkelstein, president of Performance Computing, Inc. in Chicago. "You don't want to try to combine products that were never meant to work together," he said. "All these products have some problems, and people should make it their business to know about the problems before they buy."

Corvus edges toward fiscal solvency

BY JIM NASH
CW STAFF

SAN JOSE, Calif. — Outrage has been replaced by acceptance — even gratitude — at Corvus Systems, Inc. following its emergence from Chapter 11 bankruptcy protection.

The local-area networking company announced last week that its new owner, Carl Berg, had taken it out of Chapter 11. It was Berg, Corvus' single largest shareholder and secured creditor, who sent a panic through the company and its stockholders in May in his successful bid to take control of the company.

"He brought us out of Chapter 11," company spokeswoman Gloria Leonard said, "and he's putting quite a bit of his own money toward paying off secured and unsecured creditors." Leonard was one of the company employees who expressed disbelief last spring at Berg's take-all reorganization plan.

Under Berg's new plan, which was approved by Corvus creditors and the U.S. Bankruptcy Court this month, he becomes the company's president and chief executive officer. Berg, a former Corvus director, serves as a general partner at Berg & Berg Industrial Developers in Cupertino, Calif.

All current equity investors will be issued shares in a newly formed California firm, Ceron Corp., as part of the plan, according to Leonard. Ceron was set up by Berg, Leonard said, and will have sole rights to license all Corvus technology developed before July 16.

It will also receive royalties from company technology sold before July 16 to Nippon Electronic Corp. Two Corvus directors, Roger Mosher and Robert Butche, became interim directors of Ceron as of July 16.

Former Corvus shareholders will receive Ceron stock in the same proportion that they held in Corvus. The stockholders' profit will rise or fall depending on the licensing sales by Ceron of old Corvus industrial and intellectual property rights and patents.

Berg's previous reorganization plan would have stripped equity investors of all Corvus stock without compensation. Under the new plan, Berg & Berg will become the sole Corvus stockholder in exchange for the $3.2 million it claimed it was owed by Corvus.

Unsecured creditors will be paid 25 cents on the dollar for their debt claims, Leonard explained. A maximum of $1.2 million will be paid from Corvus' cash on hand, with Berg & Berg picking up any shortfall, according to a statement issued by Gregory Coplans, legal advisor for Corvus.

Founded in 1979, the maker of networking hardware and software petitioned for relief from its creditors in 1988.

EDITOR'S NOTEBOOK

PC Computing: Back in the USSR

MOSCOW — *Crack open the classified ad pages of almost any U.S. personal computer magazine and you will find that a fully configured mail-order PC based on the Intel Corp. 80386 chip can be yours for less than $3,000. That same machine costs the equivalent of $35,000 in the Soviet Union — if you can find one. Blank floppy disks can fetch $50. PC software is pirated at an alarming rate. Computing at large sites can grind to a halt while operators wait for spare parts, which are in universally short supply in the USSR. The local phone system can make simple data transmission between systems an excursion to frustration. International data communications is virtually out of the question.*

Despite these and other overbearing facts of computing life in the USSR, the Soviets are making some strides in acquiring more state-of-the-art hardware and software. The U.S. has recently greatly relaxed the export restrictions on equipment bound for the Soviet Union. The pool of Soviet programming talent is deep. However, foreign currency to buy computer equipment remains scarce, and fluid product distribution channels do not exist.

With this backdrop, International Data Corp. co-sponsored the first PC World Forum earlier this month, held on the site of the USSR's economic achievement park. While it would be difficult to give even an overview of the computing scene in the Soviet Union, much can be gleaned from the words of conference speakers and attendees.

"The Soviet economy now is at a very complex point. In forming business relations, we don't expect you [Americans] to deal in our currency." — Dr. Boris Antoniuk, adviser to the chairman on international economy of the USSR State Committee.

"The best thing is to find a friend with a PC and buy some time from him. Who can afford to buy them? And the bigger machines are available only on allocation [from the state]. We'd like to think optimistically, but change is not happening very fast." — Alexander Shudkoff, operations manager at a fishing cooperative near Riga.

"We've spent more energy in the past on ways of distributing currency internally than on earning it. Our foreign economic relations mirror our internal economic state . . . If we are going to learn to swim, we must be in the water." — Ivan Ivanov, deputy chairman, Foreign Economic Commission.

"You don't just go to the store and buy parts when they break. You call around and ask friends who might owe you a favor. We try to do things in software that might get us around hardware problems, but there are limits to that I'm sure you can appreciate." — Anatoly Volkan, systems director at a Leningrad-based turbine factory.

"There are today areas of fundamental difference in our economies . . . The USSR must extend copyright and patent protection to U.S. and Western-made products." — Bradley Holmes, director of international communications and information policy at the U.S. State Department.

"We have a huge market here, a huge market. You'd probably be very surprised at the use we make of what we have. But our own system does not make it easy to change, despite *perestroika* and the reforms. If we could sell our programming skills easily, we'd be better off." — Revaz Mesarkishvili, vice-president of Tbilisoft, a Soviet/U.S. computer reselling venture.

"Like Donald Trump, the Soviet Union is in the middle of a cash-flow problem. Here they must create a class of investment bankers and venture capitalists to identify the best investment opportunities in this very rich country." — Bill Chastka, president of Washington, D.C.-based Resources International.

"I have to be optimistic about the future here. True, we have so to go to up in computing. But we have very bright people. Yes, I am optimistic." — Grigori Gromov, Moscow consultant and 20-year veteran of USSR Academy of Sciences.

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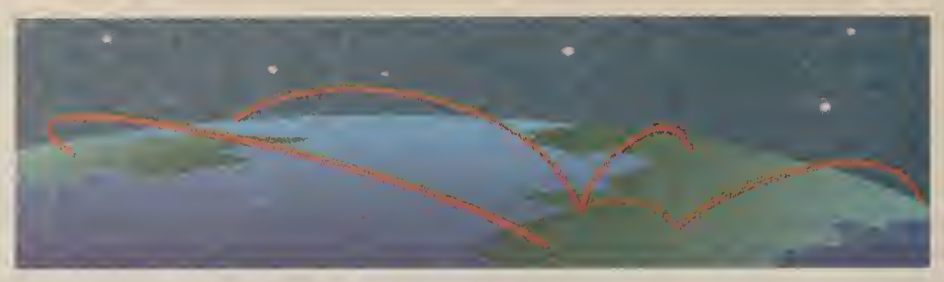
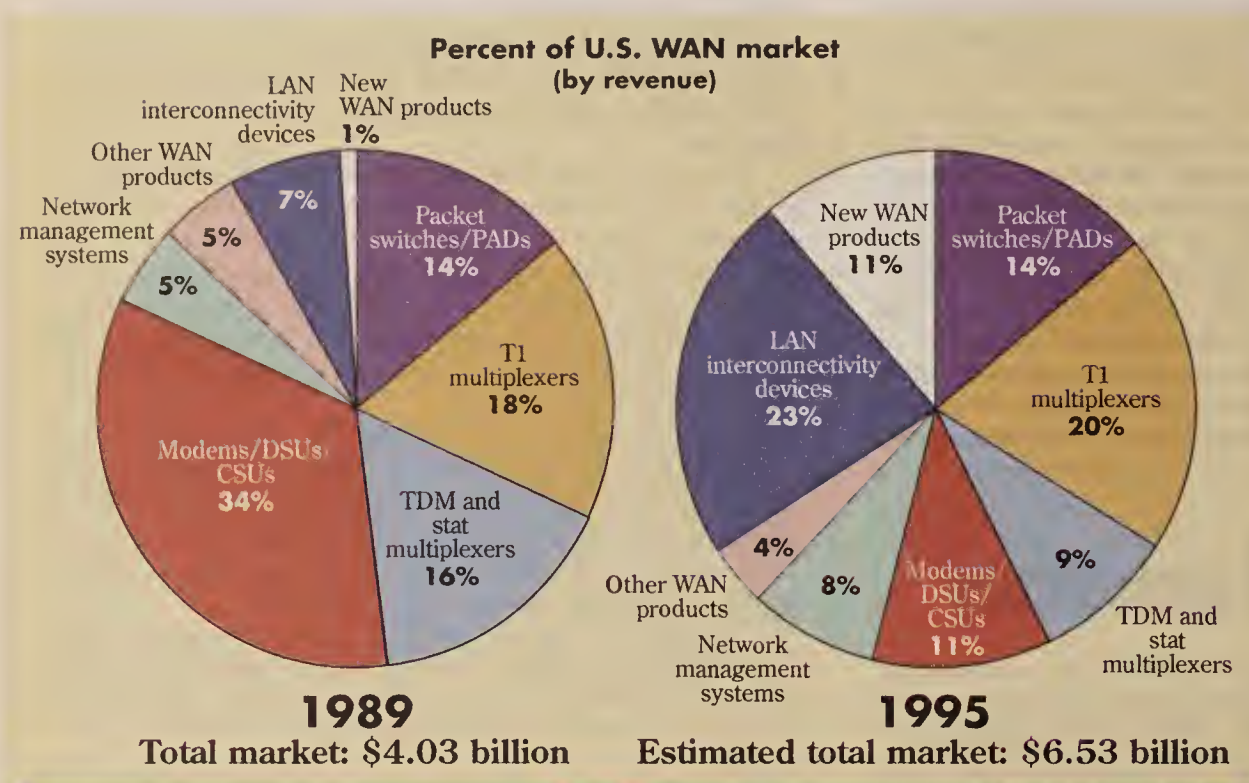


Private Wide-Area Networks

After years of building stand-alone local-area networks in remote locations, the future of computer systems architectures is in interconnection



Market Happenings

- **T1 multiplexers**: Second-largest WAN product category today ▸▸▸ Dramatic decreases in T1 line costs will keep the T1 backbone WAN in implementation plans for years to come
- **LAN interconnectivity devices** (e.g., remote bridges, routers and gateways): Shipments worth only $282 million in '89 ▸▸▸ Expected to be the primary products in developing WANs. Will surpass shipments of T1 multiplexers
- **Modems:** By far the most widely used product in networking ▸▸▸ Aging product giving way to newer technologies
- **New WAN products** (e.g., T3 multiplexers, fast-packet switches, LAN-to-WAN networks): As technology evolves and prices become more affordable, use of such products will continue to snowball

Source: Frost & Sullivan, Inc., New York, N.Y.

CW Chart: Paul Mock

NEXT WEEK

In the 1990s, the hotel industry will turn aggressively toward computer technology to help fill empty rooms and upgrade service. Finding the balance between cost efficiency and customer service is the critical need that information systems must help fill for hotels. Read about the changing hotel industry in Manager's Journal.

David Flaherty

ISDN and LANs? Sounds like two favorite but unrelated buzzwords knocking together, right? Not so fast. The University of West Virginia has created an innovative, low-cost ISDN LAN gateway service that links remote users. Designers say the system has wide applicability for all kinds of groups. Read the inside story in the In Depth section.

INSIDE LINES

Tinkering under the hood

Hewlett-Packard and Ford are soon expected to announce that they're getting together to provide manufacturing systems for automakers. Betting that the auto industry is no longer cutthroat but has learned humility in the face of unrelenting competition, the two companies will develop software that can be used in generic assembly lines.

'Anything you can do, we can go under'

In a bold(?) move to undercut IBM's Personal System/1 in the home market, Tandy will introduce a new home computer tomorrow that is "designed from the ground up for people who have never touched a computer keyboard," a spokesman said. Tandy must be hoping to sell to the underinformed, because the system will undershoot IBM's low-tech offering with a configuration that, according to one insider, uses an Intel 8086-based processor and offers an 8-MHz clock speed, 512K bytes of memory and bundled versions of DOS and productivity packages. It will also undercut IBM's prices, reportedly retailing for about $750.

Global naming: Late

Significant problems continue to plague development of Novell's Netware Naming Service and Remote Management software. A beta-testing site scheduled to receive Naming Service last month has been told that it will be delayed. Novell, which has declined comment on queries about its Naming Service, gave its beta-test user no date for its arrival. Instead, the user was offered beta dibs on the remote network management software. Both items were supposed to be delivered last month.

On the move

Martin Goetz, former president of Applied Data Research, is thinking of changing jobs again. Goetz left ADR two years ago to go to Syllogy Corp., which he left nearly a year ago to become an independent consultant. So what's next? Goetz attended a recent CASE conference on behalf of a company he wouldn't name, saying only that it is "a possible competitor to AI Corp." and that its interest is in so-called fuzzy logic. Goetz said he was at the conference to try to raise money for the company but added that he "will probably" go over to the company full time. Stay tuned.

Just the fax, ma'am

McDonnell Douglas' highly unpopular unplugging of Douglas Aircraft's IBM Professional Office System (Profs) electronic mail system in Southern California [CW, July 16] was followed last week by an acute shortage of fax paper, insiders reported. The Profs system, cut as part of a $700 million austerity move, was accompanied by a deliberate shutdown of the IBM mainframe "notes facility," which ran under the VM operating system, employees said. "They're grasping at straws to save money," said one exasperated manager at the Long Beach, Calif., site. On July 16, McDonnell Douglas' St. Louis headquarters announced 17,000 more layoffs, 9,000 of them at California sites.

Fear-mongering

A Novell marketing executive took a look at the calendar this month and saw that the 13th fell on a Friday. Though not the superstitious sort, he sent out a memo to employees alerting them that the 13th was the trigger date for some strains of computer viruses. The memo seemed to suggest that a new virus had been discovered specifically targeting local-area networks running Netware, a source said. A Novell public relations person alerted the firm's distributors and put them into a panic until the mess was straightened out. One distributor even claimed it had been hit by the new virus.

One Stardent intimate brimming with insider knowledge pulled no punches in despair over the inner turmoil. "On one side we've got a ninny, and on the other we've got someone who's immoral," the source said. If you can document how the shoe fits the respective bosses, pass the information on via News Editor Pete Bartolik at 800-343-6474, fax us the facts at 508-875-8931 or whisper confidences to the COMPUTERWORLD address on MCI Mail.

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